approach

JUNE/JULY 1984 THE NAVAL AVIATION SAFETY REVIEW

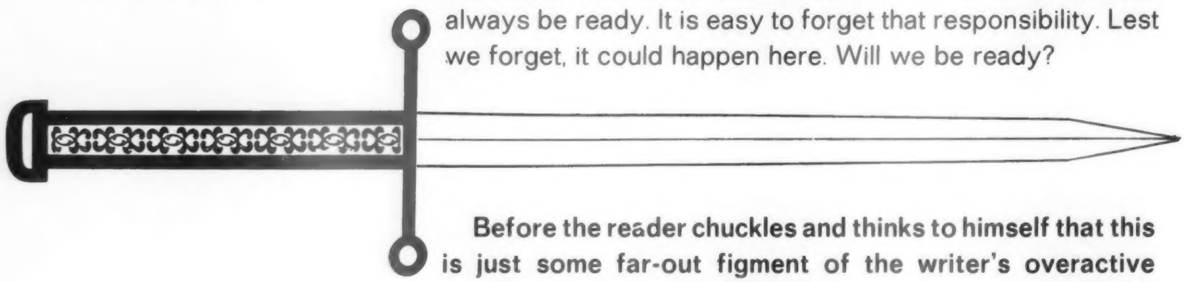
Are you Ready?

From an Anymouse:

As I stood my hangar deck security watch at a naval air station one night in November, these thoughts were with me. As the cold wind blew across the bay, I thought of the barracks bombing in Beirut, the Cuban buildup in Grenada and the threat of retaliation toward American military installations. I thought, "Hey, not on my watch," but why not on my watch? Picture if you will, one petty officer armed with a walkie-talkie radio standing guard on a hangar full of aircraft. Suddenly, over the sea wall comes a band of commandos carrying explosives. As the watch rounds the back side of the hangar, they scramble across the apron and hurl explosives into the hangar. Before any word can be passed, the planes and hangar explode into a tremendous fireball.

No warning, no resistance, no explanation — the perpetrators escape by boat. "Not on my watch . . ." Terrorism — it happened in Beirut; it can happen anywhere.

We defenders of the peace, who are entrusted with the security of our equipment, our nation and our freedom must always be ready. It is easy to forget that responsibility. Lest we forget, it could happen here. Will we be ready?



Before the reader chuckles and thinks to himself that this is just some far-out figment of the writer's overactive imagination, let's remember that such have occurred in the past few months overseas. Many experts have been predicting that terrorist violence in CONUS is likely to occur in the near future.

The CNO is sufficiently aware of such a possibility that he originated a priority NAVOP message (092241Z Nov 83) entitled "Physical Security Awareness." The following is quoted from the first paragraph of the NAVOP. "Recent events serve to underscore an increasing physical security threat. Stronger emphasis on physical and general security awareness, with a 'heads-up' approach to security by all hands is necessary."

The message further states that the protection of people and property is the responsibility of command.

CNO has sounded the alarm. He closed by stating, "Avoid surprise and think the unexpected." The ball is in your court.

NAVAIR 00-75-510

inside approach

Vol. 29 No. 12

A CH-53E (top) and CH-53D depart on a mission from NAS Norfolk. The new Echo can be distinguished from the Delta by its 7-blade main rotor, the thicker, canted tail rotor pylon and the third engine mounted directly below the main rotor hub. Photo by Peter B. Mersky.

FEATURES

DEPARTMENTS

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One of us will be killed within the next two years. Foolhardiness and reality evasion will be our executioners. But we'll go out in style — in a multimillion dollar naval aircraft — splattered amidst jagged shards of mangled metal by impact forces that far exceeded human and mechanical tolerances. And then in an ecstatic climax, our remains will be ritualistically disintegrated in an intense explosion of fire and billowing, black smoke — all in our honor. And just because of an unanticipated encounter with . . .

A Deadly Disturbance

A summer 1984 microburst update *condensed* especially for our Approach readership

By Lcdr. Joseph F. Towers
VR-57

THE atmosphere in which we fly is not a homogeneous mass of air and steady state wind. It is a fluid and highly dynamic environment. Ordinarily, an aircraft in flight is quite capable of safely traversing changes in wind speed and direction as it accelerates and decelerates proportionately to compensate for such changes over a negotiable distance, time and altitude. When disturbances in the atmosphere occur at a rate that exceeds the ability of the man-machine interface to compensate, then safety of flight is jeopardized. The convectively generated microburst is one such disturbance since it can produce *severe low altitude shears.*

A microburst is an intense, highly localized downward atmospheric flow with velocities of 2,000 to 6,000 fpm that may emanate below a convective cloud base. Typically, the downdraft is about 1 km wide until it begins to spread horizontally in a diverging, asymmetrical pattern of violent, powerful wind as it approaches the earth's surface and extends in diameter up to 4 km. Maximum differential velocities ranging from 20 to 200 plus knots exist approximately 75 meters above the earth's surface with gradual decreases above and below. (Surface frictional forces close to the earth's surface are believed to reduce wind velocities somewhat below this height.) Obviously these small scale atmospheric flows are extremely dangerous to aircraft during the vulnerable takeoff, approach and go-around phase. Just to give you an idea of how lethal they can be, the microburst that precipitated the New Orleans disaster was of *only medium intensity.* (The August 1983 Andrews AFB microburst was the strongest ever documented with its plus 84-knot winds followed by 130 plus knots on the opposite side for a differential in excess of 210 knots!)

Microbursts are common and occur in a wide variety of convective storms with their detection being extremely difficult with existing technology. However, certain telltale signs such as heavy rain, virga, turbulent and gusty conditions, blowing dust, roll clouds, wind shear alerts or pireps should alert us to the distinct possibility of microburst development when in the vicinity of convective activity. As aviators, we must analyze the situation, and should any doubt exist, take whatever action is required not to proceed in harm's way.

The phenomenon may produce little or no rain at the earth's surface. This type is commonly referred to as a *dry microburst* and is usually confined to the dryer atmospheres such as those found in the western United States. Virga, an etherally beautiful phenomenon, is often present. It is precipitation falling from high level convective clouds and evaporating before it hits the ground. During the evaporation process, the downdraft is further cooled, causing it to accelerate more rapidly. An approach or takeoff in the vicinity of virga would not be recommended since you can almost be assured that a fast-moving downflow exists. The

This is a photograph of an actual microburst over Denver taken by the Joint Airport Weather Studies (JAWS) project. The overcast at the top is a rolling cumulus-type cloud formation. The light area on the left is clear air without precipitation. The ground is even sunlit. Yet, to the right is a strong, wet microburst powerful enough to stall a large aircraft on final to Stapleton International.

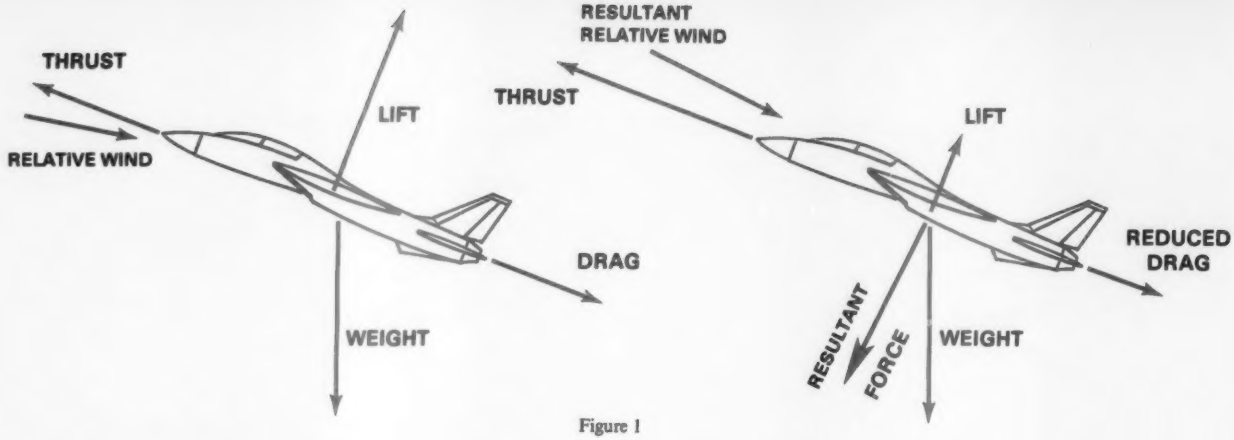

Figure 1

Figure 1 depicts the four forces of acceleration acting on an aircraft in flight. During microburst penetration, these forces can become unfavorably unbalanced due to a transitory reduction in lift. The result is an adversely altered flight profile as the aircraft transitions to an equalibrium condition.

other type is a *wet microburst* which is often accompanied by torrential rainfall. Although both types are relatively common and seem to develop through slightly different mechanisms, there appears to be no obvious difference in their outflow structure.

Data does not lead us to believe that there is any correlation between rainfall rate and the existence of wind shear. As for radar reflectivity to indicate the possibility of potential wind shear, you just can't rely on it. Furthermore, there's no correlation between storm intensity and microburst development. I'm not saying that a thunderstorm won't develop an intense downburst with an associated gust front; it's just that microburst may or may not develop under such conditions. (To keep it simple, however, if thunderstorms are present, expect trouble. And remember, you may find it elsewhere, beneath any *convective clouds.*)

Typically, a microburst can take from five to 10 minutes from the time its diverging flow first hits the earth's surface until it reaches its maximum intensity. During this period, one aircraft may penetrate the phenomenon as it is developing. Although this condition may be successfully negotiated, there exists no assurance that a following aircraft may safely traverse. Once maximum intensity is achieved, this sustained rate may last from five to 10 minutes prior to dissipation, or it may develop into a larger scale event lasting in excess of 30 minutes. A particularly significant fact is that *microbursts develop in groups or families of two or more, so the presence of one should increase our alertness for other such occurrences.*

It's possible for a microburst to generate horizontal wind velocities that far exceed the velocity of the downflow. This is caused by the stretching deformation of a vortex ring creating a low pressure area which further accelerates the lateral air flow.

An overwhelming percentage of microburst-related mishaps and incidents have occurred during June, July or August between the hours of 1400 and 1900. In every case, thunderstorms or intense convective activity was in the area. Almost without exception, *there existed some known precursor event or warning of impending danger.* Unfortunately, the human communicative process often failed, and crucial, real-time information was not realized or passed to the mishap aircraft. So, if you observe or encounter indications of impending danger, be specific and get the word out. Microbursts are such short-lived events that the dissemination of real-time information is crucial. Your input could be what it takes to prevent a devastating encounter in the critical space-time window.

As far as *heavy rain* is concerned, there exists no empirical data linking its detrimental effects (such as significant increases in drag and decreases in lift) to an airfoil in flight. At present, in my opinion, heavy rain by itself does not appear to present a severe danger. In contrast, windshear by itself can dangerously affect flight. Although windshear can often appear with heavy rain in unsafe flight conditions, this shouldn't be misinterpreted to imply that heavy rain is the primary culprit.*

*Author's Notes: More study is needed in this area to validate the excellent work already being done by James K. Luers, a research scientist and heavy rain theoretician with the University of Dayton Research Institute. Furthermore, according to Mr. Luers, there exists the distinct possibility that heavy rain, due to its direction of travel being different from the relative wind, may cause the ALPHA-VANE to realign itself at a slightly

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Theoretical aspects of microburst flight. A microburst has three distinct phases as an aircraft traverses it. The main force is downward with an associated gust front that moves outward, radially from the focal point of the microburst as it nears the earth.

Initial signs of a headwind penetration would include an increase in indicated air speed and angle of attack. This increase in dynamic pressure and lift coefficient temporarily generates additional lift. As a result, an increased performance flight profile is achieved. The headwind phase begins to develop a downward vector component as the wind pattern transitions to the downburst phase. During this period, the resultant relative wind continously reduces the angle of attack. As the downburst phase is entered, cockpit indications will register a further reduction in AOA, accompanied by decaying IAS.

As the flight profile continues, both IAS and AOA will be continually reduced, with more critical deterioration in aircraft performance. Obviously, some extreme measures may be required to survive.

Imagine for a moment an aircraft on final approach or takeoff with the relative airstream impacting an imaginary chord line from below. The airfoil is under the influence of a positive angle of attack with a corresponding positive lift coefficient for the given airfoil configuration. The resultant lift sustains the aircraft in flight.

Now, complicate the situation with the entry of a massive, concentrated column of air traveling at a downward velocity of up to 50 knots. The overall change in the relative wind is such that it is now coming more from above and in line with the wing with a corresponding reduction in the lift coefficient. Depending on conditions, it is possible for the AOA to become critically reduced, with or without a significant change in IAS.

Rotating the aircraft to a higher deck angle can change the AOA to a more favorable reference. The application of maximum thrust will normally serve to accelerate the aircraft mass, thereby generating a new relative wind and AOA and placing the aircraft in a safer flight regime. Prior to the encounter, faster approach and departure speeds diminish the detrimental effects of the microburst's downward vector components. Furthermore, this provides an increased buffer above stall and gives the aircraft a greater energy tradeoff (kinetic energy for potential energy), should it be required.

It is extremely important to realize that *no guarantee for success exists, since the physical forces of the given shear or microburst can easily exceed the aerodynamic capability of your aircraft — regardless of type!*

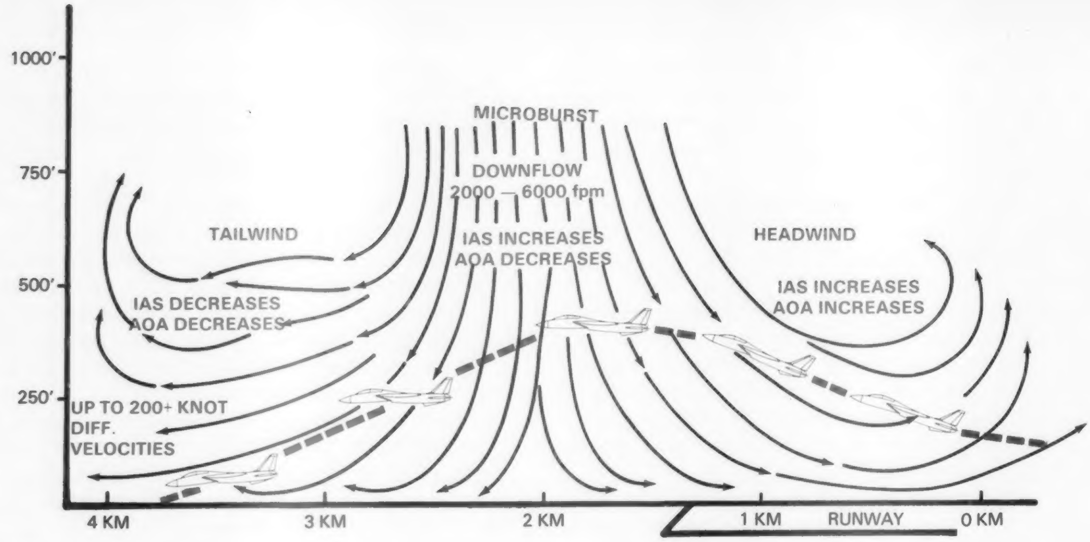
As we analyze the problem, it should become apparent that minimizing weight and drag while maximizing thrust and lift will be most advantageous. Weight should ideally be at a minimum. Obviously, a light aircraft will accelerate and climb more rapidly than a heavy one when the same amount of thrust is applied. Reducing drag to the minimum practicable during the takeoff, approach or go-around will minimize the subtractive penalty applied against thrust. In *extremis*, the powerplants should be commanded to produce the maximum possible amount of thrust regardless of engine operating limitations. (After all, engines are much easier to replace than hulls or lives.) Lift generation should be nearly equal to or greater than weight. This may be controlled through such parameters as thrust, IAS, g-loading, AOA and airfoil configuration.

Changes in longitudinal stability will occur. As IAS and AOA are dramatically altered, the pressure distribution around the airfoil changes, creating a pitching moment as the aircraft initially tends to return to equilibrium. Normally, excess airspeed will result in a slight upward pitching moment and an increased performance profile while a decrease in indicated airspeed will cause a slight pitch reduction with a decreasing performance profile. The magnitude of the displacement would be affected by such parameters as initial entry speed, time, airfoil configuration, changes in AOA, applied thrust-to-weight ratio, the vertical and horizontal component of the shear and control inputs by the flight crew. Given enough altitude and time, the aircraft would eventually return to equilibrium at some lower altitude.

There should exist near-unanimous agreement that the indiscriminate chasing of indicated airspeed, without cross-reference to other instrumentation, can in itself kill. During the highly dynamic conditions of microburst flight, airspeed is an inferior and invalid parameter for adequately deciphering the entire aerodynamic picture. Under steady-state wind conditions and 1-g wing loading, airspeed would normally be a sufficient parameter to rely on. *But we now find ourselves in an unusual flight regime where the normal relationship between IAS and AOA has been altered to an unknown and variable degree. Under such conditions, we*

lower value than the true AOA. This may cause readings of AOA and inputs to stall warning systems to be erroneous. For purposes of this discussion, heavy rain is rainfall-rate exceeding *six inches per hour* that may have an adverse effect at *high AOA conditions* when the aircraft is exposed for 30 seconds or more during critical phases of flight. When operating at high airspeeds (or low AOA conditions) or the rainfall-rate is below this intensity, the aerodynamic effects are not believed to be significant. NASA plans to further investigate specific problems associated with heavy rain in the near future.

Special appreciation is due Dr. John McCarthy from the National Center for Atmospheric Research for providing his research papers on data from the JAWS PROJECT and to the participants at NASA's Seventh Annual Workshop on Meteorlogical and Environmental Inputs to Aviation Systems held at the University of Tennessee Space Institute.



Consider this atmospheric disturbance with the anticipated changes in longitudinal stability and flight profile of an aircraft under a constant thrust setting and a neutrally trimmed condition. Initial headwind penetration will result in significant increases in IAS and AOA producing an INCREASED PERFORMANCE PROFILE. As the aircraft then penetrates the downflow and tailwind areas, critical losses of IAS and AOA will occur. These combined reductions will severely impair the aircraft's ability to generate life and sustain flight thereby resulting in a DECREASED PERFORMANCE PROFILE.

If the aircraft is not developing sufficient lift to support its weight, the resultant vector (of lift, weight, thrust and drag) will create an unbalanced force to gravitationally accelerate the craft in the downward vertical plane as an equalibrium condition is sought. During this transition, the flight profile is adversely altered. If such an oscillation is not interrupted by the flight crew or the negative vertical displacement exceeds altitude available, ground impact can easily occur.

Two serious complications arise: (1) the accuracy of pressure sensitive instruments such as the altimeter and vertical speed indicator has NOT been determined during microburst penetration, and (2) assuming that the flight crew can achieve favorable stabilization, there would come a second order of effect that would require that the aircraft climb rate exceed the rate of descent of the descending airflow in order for a net climb rate to result, relative to the ground.

should be more concerned with the minimum drag AOA and stall AOA.

Maximizing performance during *extremis* microburst flight. Although the strength of any given shear or microburst would be impossible to ascertain beforehand, *situations exist that may be survivable if the full aerodynamic capability of the aircraft is expediously exploited*!

During *extremis*, I believe that PERFORMANCE CAN BEST BE MAXIMIZED by instinctively applying MAXIMUM THRUST (and executing a missed approach) while:

- Initially rotating to the AOA FOR MAXIMUM LIFT GENERATION to discontinue or prevent a downward vertical velocity, and once level flight is achieved, then
- flying out at the AOA FOR BEST CLIMB ANGLE until a positive rate of climb is achieved and obstacles are cleared, finally
- accelerating to the AOA FOR BEST CLIMB RATE. (For simplicity, Navy tactical aircraft should fly out at optimum AOA.)

FOR NON-AOA INDICATOR EQUIPPED AIRCRAFT

- initially increase pitch attitude until the descent rate is arrested and a level flight condition is achieved *or* a stickshaker condition is reached. (Consider extending flaps to an intermediate setting to achieve a greater lift coefficient without a substantial increase in drag.)

Avoid the intitial tendency (of both pilot and aircraft) to reduce pitch attitude in an attempt to chase decaying IAS, since any net gain would be very costly in terms of altitude loss and performance degradation. Attempt, if possible, to utilize additional thrust to accelerate the aircraft and transfer propulsive energy into a climb or at least to maintain level flight until the microburst is exited. Expect deck angles during this maneuver to be greater than those normally required. This is a highly dynamic condition requiring continuous adjustments in attitude.

WARNING

Unnecessary overrotation to stickshaker can place the aircraft dangerously and prematurely close to stall. Rotate only enough to arrest the descent and maintain level flight. Rotation to stickshaker should only be attempted if ground impact *appears* inevitable.

As the aircraft attempts to accelerate, not rotating to transfer excess kinetic energy to arrest the descent may result in ground impact.

NOTE

Performance would be improved, prior to such an encounter, by using the minimum flap setting and the carrying of as much excess kinetic energy (IAS) as is practicable for the given takeoff or approach.

Two very serious complications arise: (1) The accuracy of pressure-sensitive instruments such as the altimeter and vertical speed indicator has *not* been determined during microburst penetration and (2) assuming that a flight crew can achieve favorable stabilization, there comes a second order of effect that would require that the aircraft climb rate exceed the rate of descent of the descending downflow in order for a net climb rate to result, relative to the ground. Cross-reference to the radar altimeters is strongly recommended.

So far as you and I are concerned, it's imperative we maintain a minimum of 1-G flight and avoid the development of a descent rate. If a positive climb rate can't be initially maintained or achieved, attempt to fly out in at least a level flight condition. Once downward acceleration has developed, it requires an extraordinary force to overcome, one which is nearly impossible for an energy deficient aircraft to generate, especially when given very limited time and altitude constraints.

As our once vivid recollection of past tragedy rapidly fades from memory, our tendency is to become more complacent. This is further complicated by an accompanying phenomenon commonly referred to as *reality evasion* — that mythical probability of danger with the increased liklihood of precipitating disaster. As key players, our objective is obviously to prevent such an event from occurring.

An explanation and solution to this complex phenomenon lies in the wind. The problem with such an atmospheric disturbance is that because the relative wind is changing so dramatically, it can easily exceed our ability to safely negotiate it. The answer may be in the wind, but the successful execution of the required performance to survive can be as elusive as the wind itself. Don't be taken in by this deadly game of Russian roulette.

Who Says it Can't Happen? Some overzealous NATOPS checkers have been known to compound emergencies during check rides or simulator periods, driving some pilots crazy. But not even the most ruthless Jekyll and Hyde team would present a crew with the combination of circumstances which befell a Reeve Aleutian Electra crew this past summer. The aircraft and flight bear such close resemblance to Navy P-3 operations that the story is worth retelling. Buckle your seatbelts.

The Electra was cruise-climbing in the blocks FL190 to FL250 on its scheduled flight from Cold Bay in the Aleutians to Seattle, when the entire No. 4 propeller and reduction gearbox suddenly separated from the engine. While falling away from the aircraft, it struck the No. 3 oil cooler and cut a 12-18 inch gash in the lower part of the fuselage just forward of the wing. The rapid decompression resulting from this gash caused the floor to cave in at the midfuselage area. The collapsed flooring caused a binding of the flight controls and, unknown to the crew, knocked the engine power lever cables off their pulleys. The crew donned oxygen masks and initiated an emergency descent. At this point they found the flight controls were jammed, and the three remaining engines were stuck at cruise power. The autopilot was reengaged and its electric servos used to override the flight controls. Both pilots were required on the controls to fly the airplane without the autopilot engaged.

After extensive discussions, the crew elected not to attempt a landing at either Cold Bay or King Salmon but to continue to Anchorage. Originally the plan was a ditching in the flats at Cook Inlet but finally the decision was made to attempt a landing on Runway 6R at Anchorage. Airline engineers determined that the flaps could be lowered and an approach was started. However, when the landing gear was lowered the aircraft rolled right uncontrollably. Airline engineers determined the Electra could be controlled with the gear down if the No. 2 engine was shut down. The No. 2 prop was feathered, the gear lowered and another approach attempted. With engines No. 1 and 3 still at cruise power, No. 2 feathered and No. 4 missing, the Electra crossed the fence slightly high at 170 knots. The crew went around. The next approach was started much farther out on a very flat, one degree glideslope. Airspeed was slowly bled off and the aircraft touched down nosewheel first. The remaining two engines were immediately feathered with the resultant loss of all electric and hydraulic power. The aircraft was virtually unsteerable. The emergency air brake was used to attempt to stop the aircraft as reverse was obviously unavailable. Due to the high speed, the left brake caught fire under brake pressure. The aircraft drifted off the left side of the runway and came to rest in a ditch. Although the Electra was substantially damaged, no one was seriously injured in the landing. The crew received an air-safety award from the Airline Pilots Association, and the captain was personally congratulated by President Reagan.

Luck or skill? Or both? This crew faced at least six, depending on how you count, different emergencies straight out of section five of the P-3 NATOPS. They followed procedures, sought help from knowledgeable ground sources, made slow, prudent decisons and lived to tell about it.

Submitted by,
Lcdr. Paul Eschenfelder, USNR-R
VP-67

That Can't Happen to an A-4. About 20 minutes into a Profile "D" post-

maintenance checkflight (PMCF) on a TA-4J, Lt. Bill Loeffler of VT-22 had lost normal control of speedbrake actuation. The emergency actuator worked but would not hold the speedbrakes in the open position. This was no major problem, and he continued on with the PMCF.

Passing 235 KIAS on the flap blowback check, a loud thump was heard and the aircraft started an immediate rapid roll to the right. The roll was countered with ailerons, but the flaps had to be raised to stop the roll. A nearby aircraft joined on Loeffler for a visual inspection. The flaps were lowered and the aircraft again rolled almost uncontrollably to the right. Prior to raising the flaps, a visual inspection revealed that the left flap was fully extended, but the right one was only one-fourth of the way down with the inboard edge buckled. At this point, the PMCF was terminated and Loeffler headed home experiencing no additional aircraft control problems. An uneventful no-flap, no-speedbrake approach to a field arrestment was made.

Postflight inspection revealed a broken hinge on the inboard side of the starboard flap and a crack in the center of the flap running its full length fore and aft.

This event happened under a controlled situation (PMCF), in ideal conditions and resulted in a safe return and landing at home base. However, it would not have taken much, especially in a training environment, for this to have happened at the wrong place at the wrong time. A well-done to Loeffler for his quick assessment of the situation and timely reactions which prevented the loss of a valuable aircraft.

In the Blind. On 26 February 1983, while flying at 7,000 feet on a cross-country flight, an H-46 crew, Lcdr. Jerry M. Haggerty (pilot), Lt. John L. Green (copilot) and AMSC Ronald V. Hawn (crew chief) observed a momentary flicker on the MASTER CAUTION warning panel. Seconds later the MASTER CAUTION light illuminated steadily accompanied by a transmission chip detector light. Haggerty declared an emergency notifying Los Angeles Center that he was descending from 7,000 feet. When Hawn went aft, he discovered oil leaking from the transmission accompanied by a large amount of smoke.

The crew performed NATOPS emergency procedures for an imminent transmission failure as Green spotted what appeared to be a large, open parking lot beneath them. Passing through 3,000 feet, the volume of smoke increased and noise from the aft transmission area became audible to all in the aircraft. During descent, the pilot noted that the "open" parking lot was actually crisscrossed with rows of trees and lampposts. Adding to the emergency, at approximately 1,500 feet, the temperature differential caused the cockpit windscreen and windows to fog over both inside and out. With no forward visibility, Haggerty continued the descent while Green and Hawn provided clearances on both sides of the aircraft. For touchdown, Haggerty looked through his open side-window for lineup on a row of trees while executing a flawless, no-hover landing. The aircraft was shut down and evacuated. No more than 15 feet of clearance existed between the aircraft and surrounding obstacles.

A Bolt Failure Save. Upon returning from a routine F-4 air-to-air intercept mission, 1st Lt. Reid White and Lt. Claiborne Moseley, the squadron flight surgeon, separated from the other members of their flight for an individual GCA to a full-stop landing. At eight miles from the field, with 4,200 pounds of fuel, White lowered the landing gear. The mainmounts came down normally, but the nosewheel indicator revealed that the nosewheel had remained up. Another squadron aircraft joined on White and confirmed that the nose gear was in the up position, with the door closed. Although inexperienced in the aircraft, Moseley pulled out the pocket checklist and read the procedures to White. Numerous attempts were made to get the nosewheel extended including negative-G, gear cycling and finally emergency pneumatic extension. All were unsuccessful; the nosewheel remained up with the door closed. Now low on fuel, White and Moseley decided the only course of action remaining was to land on the mainmounts and let the nose fall to the runway as airspeed decreased.

The pilot executed a flawless approach and landing, deployed the drag chute, shut the engines down and came to rest on the centerline after 4,500 feet of ground roll. The aircraft sustained minimal damage.

Postflight investigation revealed a failure of the rod end bolt of the uplock actuator. Failure of this $3.75 bolt will not allow the nose gear door to open by any method. When the crash crew raised the aircraft by crane so maintenance personnel could lower the nose gear, the broken bolt fell onto the runway.

White and Moseley handled this emergency in a calm, cool and extremely professional manner. Their outstanding crew coordination and professional airmanship saved a valuable asset and prevented possible serious injury to a flight crew.

This time someone got hurt

By Lcdr. Dick Avery
VF-161

TIME was running out to complete a timely launch for the early March carrier qualification period. The source of a particularly troublesome liquid oxygen leak was apparently located and a defective line hastily replaced. We launched at dusk; weather clear and forecast to remain clear with occasional frontal-associated rain showers. The first sign of trouble came as we discovered loss of cabin pressure at low power settings during an IFR descent to Marshal. A short time later, during the first approach, a second problem placed us in a very compromising position: The normal oxygen supply had gone to zero. The leak hadn't been fixed!

After a successful trap, we figured we really wouldn't need oxygen for the next trap, so we launched again, trapped and launched yet a third time. Then things started to go sour. After two bolters, our signal was gear up, hook up, divert. Ship weather was now 1,200 overcast, layered to 24,000 and light rain; divert weather was reported to be 4,000 overcast with good visibility in light rain showers.

As we began our climb, we discussed the oxygen problem and the weak cockpit pressurization. We mutually agreed to initiate our "green apples" (emergency oxygen) when cabin pressure passed 15,000 feet. It didn't take long. At about 20,000 feet MSL, the cabin pressure hit 15,000. As briefed, I actuated my emergency oxygen supply, then asked the pilot if he had good LOX (liquid oxygen) flow. In a frighteningly passive voice, he requested I stand by until he leveled off at our bingo altitude. I waited a moment and repeated myself. Now passing 25,000 feet, the pilot again requested I stand by until he leveled off and trimmed the aircraft at the bingo altitude. "Pull your apple, *now*!" I said with all the volume I could muster. I received no response.

Although level at 30,000 feet and proceeding direct to the primary divert airfield, I was now unable to get any further response from the pilot either over ICS or through inter-cockpit yelling. I was still talking to approach control, but it was apparent that the pilot was oblivious to the two-way exchange. Then the forward cockpit flood lights came on, full bright, and the pilot was holding what appeared to be a flashlight in his left hand, moving it up and down. I was certain that the pilot was hypoxic and close to becoming totally incapacitated. Alternatives flashed through my mind, and I plotted what I considered my only course of action.

I notified approach control of the situation and requested that SAR be initiated. Now 50 miles from "feet dry," with no further response from the pilot, I decided I would initiate command ejection when my supply of emergency oxygen was depleted. Four long minutes had passed since the aircraft leveled off; suddenly the aircraft commenced a 6,000 fpm controlled rate of descent. Watching reflections from the pilot's canopy, I could see that he was conscious and now apparently in control of the aircraft. I notified approach radar of my analysis of the situation and requested that all airport lighting be turned full bright to facilitate locating the field. My emergency oxygen ran out descending through 8,000 feet, and as we shallowed our descent passing 5,000 feet 10 miles from the field, lights from the area began to come into view. The pilot made a slight dogleg to facilitate a straight-in VFR approach, and we touched down with "advertised" fuel reserve remaining.

What happened? Why was the pilot without emergency oxygen and without the benefit of ICS or UHF communications on the bingo profile? Initially, the pilot's green apple had mechanically failed, and he was left without emergency oxygen. Additionally, in the pilot's attempt to locate the source of his oxygen malfunction, he haphazardly caused his upper-block UHF, ICS and oxygen connection to become disengaged. The pilot had attempted to communicate his predicament by using the flood lights and holding upper-block assembly over his left shoulder. I had misinterpreted this as an *extremis* signal. How did the pilot survive four minutes without an adequate oxygen supply? Through instinct and experience, although he insists he was totally aware of his impending hypoxic condition and every mechanical aspect of the divert and bingo profile.

We were lucky. In a separate incident, another experienced fighter aircrew lost its normal supply of oxygen and cabin pressurization on a night VFR recovery. The pilot had difficulty rendezvousing with the tanker and was told to bingo. Anxious, he became overloaded and couldn't locate his green apple. He lost consciousness climbing through 17,000 feet.

Regardless of his efforts to prompt the pilot, the RIO (radar intercept officer) helplessly watched as their jet arced through 30,000 feet and began a rapid descent perpendicular to the divert heading. At 60 degrees nose down with airspeed in excess of 450 knots passing 25,000 feet, the RIO broadcast a mayday and initiated a sucessful command dual ejection. Within an hour the aircrew was located and promptly returned to the carrier by helo. Although both the pilot and RIO sustained multiple arm "flail" fractures from the high-speed ejection, they are remarkably healthy and extremely fortunate to have survived. NATOPS human limits for this particular ejection seat were exceeded by a wide margin.

In the very personal philosophy aviators and NFOs develop through the process of training and experience, why do some aviators mature to rely on poor judgment and routinely deviate from the established standards which were written in blood? At what point in some aviator's career does professionalism and common sense give way to the flight hour, one more trap, "get-home-itis" syndrome?

Ask yourself:

How many up gripes does it take for your maintenance officer/maintenance control officer to down an otherwise up aircraft?

Do you conscientiously wade through up gripes, make a mental note of repeat gripes and get fully prepared to strap on your jet?

Do you consider oxygen discrepancies as up gripes?

Do you consider cabin pressurization difficulties as up gripes?

Are you totally knowledgeable of the bingo section of the pocket checklist and do you include bingo contingencies in your briefs?

If any of your answers are "no," it could happen to you.

(Second of a NAVSAFECEN series)

Mishap Investigation Tips from the Safety Center

In-flight Fires. Investigation of fires in aircraft mishaps shows fire damage will be present in most cases, but fire in flight is a relatively rare occurrence. Physical evidence at the scene will generally prove conclusively when the fire actually occurred.

In-flight fires will be indicated by severe burning with intense heat present. The smoke pattern and metal flow will follow the path of the slipstream and leave clean spaces on the aft side of rivets, bolts, brackets, etc. When aluminum is heated to approximately 1,750°F, and then impacted, it will exhibit a "feathering" or "broomstraw" effect. This phenomenon will not occur in ground fires. Often the actual source of the fire can be located by examining the area of greatest damage. If smoke patterns are continuous across the different pieces of wreckage, fire in flight is indicated. If this is suspected, it may be necessary to reconstruct the wreckage to aid in pinpointing the origin of the in-flight fire.

Ground fires are indicated if the inner folds of crumpled metal are clean. The smoke pattern will be sporadic and may contain the imprint of leaves and twigs. In addition, some parts of the same structural member may be burned while others are clean.

The flame temperatures of an in-flight fire may be in excess of 3,000°F due to the forced draft of the slipstream and compartment cooling air. Ground fire temperatures are usually less than 2,000°F. Some indication of the effect of various temperatures on typical aircraft components are:

1. Neoprene rubber blisters at 500°F.
2. Zinc chromate paint primers start to tan at 450°F, are brown at 500°F, are dark brown at 600°F and black at 700°F.
3. Stainless steel starts to discolar at 800 to 900°F progressing from tan to light blue and with increasing temperatures to bright blue and to black.
4. Melting temperatures of common aircraft materials are indicated below:

Material	Temperature Degrees Fahenheit
Titanium	3,100
Stainless steel	2,700
Copper	2,000
Brass bearings	1,600 — 2,000
Aluminum alloys	1,250
Magnesium alloys	1,250

When you are investigating the possibility of in-flight fire in an aircraft mishap, be aware that witnesses are often inaccurate and unreliable with respect to fire. The physical evidence at the scene will be your proof as to the origin of fire, whether it be in flight or after impact.

Smart CO Enhances OC

By Lcdr. Bradd C. Hayes
HS-6

IN every cockpit, on every flight, rides an unnoticed, silent "companion." Like the sixth man on a basketball team, "he" awaits the right moment to enter the "game" to spark the team, hopefully. We shall call "him" Organizational Climate, or just plain OC. Every commanding officer (CO) has an OC that pervades all of his command's activities. It can be a positive force enhancing safety or a devastating force that actually promotes mishaps.

Results of a CNO survey reveal that OC plays an important role in how an officer perceives his career. As Sherlock Holmes might declare, "It appears intuitively obvious, my dear Watson, to even the most casual observer that a person who enjoys his work and the atmosphere in which it is accomplished is going to be a safer individual as well as a career-oriented one." The CNO survey highlighted job characteristics identified as positive influences for aviators ranging in rank from Ltjg. to Cdr.

It was not surprising that for all ranks flying itself was considered the most positive job characteristic in the Navy. In a squadron with a good OC, flying can be the "sheer ecstasy" described so beautifully in the poem "High Flight" by John Gillespie Magee, Jr. In a squadron with a poor organizational climate, flying can be a welcome escape from the frustrations found on the ground or aboard ship.

For mid-ranking officers (Lt.-Lcdr.), camaraderie ranked very high as a positive job characteristic. Camaraderie can exist only in a squadron with a good OC. Closely following camaraderie are such characteristics as challenges, satisfaction and pride. None of these characteristics exists to any large extent in a command with a poor climate. A squadron without these characteristics may also be setting itself up for a mishap.

At any point in the chain of command, the climate can be warped by an individual who does not recognize the necessity of a good working atmosphere. The Navy has gone to great expense to provide LMET (leadership/management element training) schools for those most likely to exert a positive influence. This training is very valuable and commands should see that it is used properly. But the single most influential person in a squadron is, or should be, the CO. A good CO can motivate and inspire a good OC while a poor skipper can depress and stifle.

Poor COs share a common paranoia. They trust no one else, capriciously change written guidance without notice and then hold others accountable for it, fail to support their juniors in critical situations and manage to turn junior officers against each other rather than building friendships between them. Wow, some CO! Anybody you know?

Nearly every squadron has some form of self-screening process where unsafe practices or maneuvers are brought to light in a friendly forum where appropriate "punishment" can be meted out by a kangaroo court. In a squadron with a poor OC (and a poor CO), these meetings turn into bitter verbal warfare which destroys the very purpose for which they were established. Officers become incensed if they are "put on report" by their contemporaries and look for revenge at the earliest opportunity. They begin to "cover their six" and hide mistakes, sometimes not even taking corrective action for fear of being dragged before the inquisition. In such an OC, pilots have no assurance that the CO will support them for decisions they make during *extremis* situations. In fact, the common belief becomes that the CO will gladly place the rope around their necks if he feels it will save his career. Enter the sixth man! If during the first few critical moments of an emergency, a pilot has to wonder how the CO is going to deal with him because of his next actions, he may throw his training and instincts out the window and make an incorrect decision. The last thing a pilot needs when he is in *extremis* is such added pressure.

On the other hand, a good CO who has promoted a good OC alleviates this extra burden from his officers. He inspires confidence and initiative. Safety becomes a way of life. In such a case, the sixth man becomes a positive force promoting all that is good about a career in naval aviation. In this sort of positive atmosphere, mistakes are freely discussed and corrective action taken. Cooperation is promoted between officers and the likely results are a CNO Safety Award and a Battle E.

No amount of pay or bonus money can substitute for a good OC. You simply cannot pay people to be safe. Safety is a byproduct of professionalism and pride. Aviation is a serious business conducted by professionals and headed, hopefully, by COs who have a grasp of the necessity for a good OC.

P-3s Don't Skate Well

By Ltjg. John P. Roach
VP-23

AS we began our initial descent into AFF Frozen North, I felt relieved that this particular leg of our flight was going smoothly. Preflight had taken nearly twice as long as scheduled and on short final to our previous stop, ANGB Midwest, the flight engineer (FE) had announced an empennage deicer malfunction. Despite these and other minor annoyances, the landing at ANGB Midwest was uneventful.

Once on deck, the negotiations for a new timer motor for the emp-deicer began. The VP maintenance chief was understandably unenthusiastic about cannibalizing one of his aircraft for us, since it would take a long time for the supply system to provide a replacement for him. Being cautious, the PPC, FE and I all agreed that an operable emp-deicer was necessary just in case we encountered more icing, even though it wasn't forecast. Shortly thereafter, the maintenance chief produced a timer motor and we were once again on our way, although three hours behind schedule.

Flying across Lake Michigan, the weather cleared and from flight level 260 we had a beautiful panoramic view of the frozen north central United States. Tranquilized, we prepared for our next landing, completing the appropriate checklists and reviewing approach plates, even though we had the field in sight from 40 miles out. After all, we reasoned, it never hurts to be too cautious.

At 5,000 feet while preparing to commence the approach and switch to tower frequency (caution again, never take a visual into a strange field), Center interjected one last comment that livened things up considerably. The ground crew at our previous stop had found a large piece of tire by the runway shortly after our departure and thought it might have come from our aircraft. Unfortunately, the controller wasn't very helpful since his information was sketchy. "No, there was no information as to whether it was a nose tire or a mainmount. No, we're not sure it came from your aircraft . . . . Have a nice flight."

We contacted the tower and requested a low pass to let them inspect our gear, which was approved. The tower informed us of one other aircraft in the pattern, an Air Force A-10 conducting low passes, then mentioned something about an RCR (runway condition reading) of 03. We made our low pass and from the right seat I noticed that the runway really wasn't in very good shape. The extended

threshold was barely visible from overhead and the entire surface was obscured by milky, glistening glare ice. The tower saw no problem with our gear but suggested that we have the A-10 join us for a closer inspection. Even though we were fairly confident that anything as obvious as a missing tire would be visible from the ground, we decided that taking the extra time to have the A-10 check it out was justified. After all, we certainly didn't want to take any chances.

Using the tower frequency, we coordinated airspeed, altitude and heading with the A-10 as it approached our aircraft on extended downwind. The joinup was uneventful and confirmed that we had no gear problems. We were now about three and a half hours behind but, after all, being cautious takes time.

Since the VASI system was down and the runway threshold and most of the rest of the countryside was obscured by snow, we obtained clearance to fly the ILS final. We reasoned that this would ensure a controlled glide slope. On the way we reviewed the landing checklist and began to think about the skating rink we were about to land on.

The PPC briefed that on touchdown he would carefully bring the power levers into the ground range, maintaining directional control with differential power while bringing us to a stop. He also briefed that he would wave off if the touchdown didn't look like it would be on airspeed and on centerline. The FE and I concurred, and we were on our way to an episode that would make us forget all about gear problems.

The touchdown was good, just a hair right of centerline and on the numbers. As the PPC smoothly brought the power levers into the ground range, the props went into reverse as advertised and we began to decelerate. However, it quickly became apparent that this was not just a challenging landing, but a virtually impossible one! The aircraft began to fishtail and soon was sliding down the runway in what seemed to be a 30-degree crab while drifting left of centerline. Reverse thrust was no longer doing much at all to decrease our speed and as the 4,000-foot marker passed from right to left in front of us, the PPC called for a waveoff.

The power levers were advanced into the flight range, and my first thought was that we were going to make an awful mess out of the runway lights and radar reflectors as we departed the side of the runway. My pessimism was due to the following circumstances: We were (1) already on the ground, (2) well below flying speed, (3) skidding at an angle that was nowhere near runway heading and (4) not configured for takeoff, having land flaps and trim set.

In spite of my doubts, the aircraft began accelerating, simultaneously displaying a more pronounced drift towards the runway edge. At 115 knots I called rotate and we became airborne as the runway edge passed beneath us. After following normal waveoff procedures, power was reduced in order not to exceed our MAXIMUM RATED POWER any longer. THE FE WAS THE ONLY ONE THAT NOTICED THE OVERTORQUE ON OUR TAKEOFF ROLL!! . . . but decided that pulling power just then wouldn't have been popular.

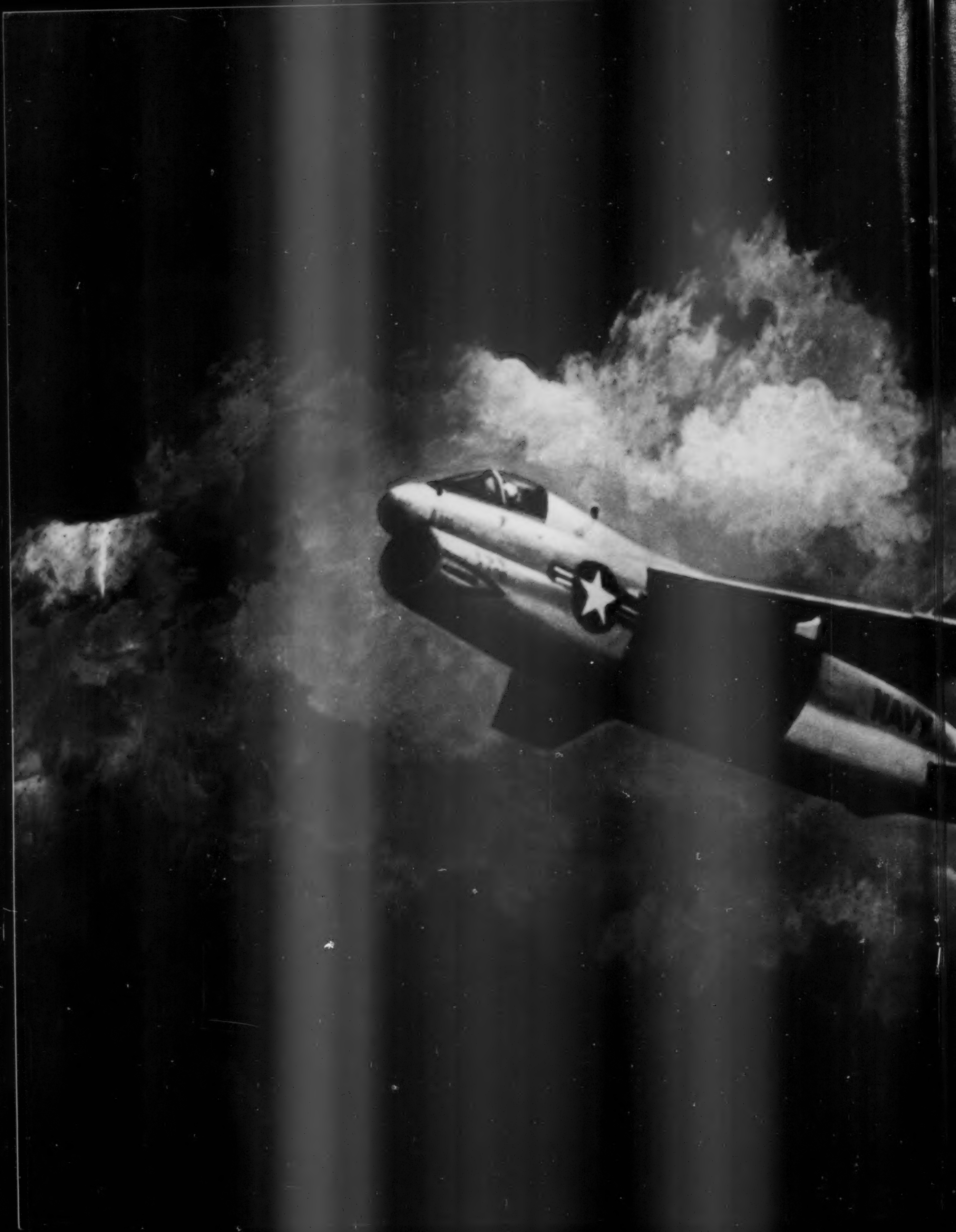
Shaken but undamaged, we called the tower to inform them of our waveoff in case they hadn't noticed. The tower sympathized with us over the conditions and invited us to try again, but we politely declined. With a little more training than we had planned on under our belts, we continued on to our next stop.

Every pilot with enough hours behind him has experienced the "standard" evolution that quickly becomes nonstandard, and I can now claim membership in that club. The question that remains is why we tried to land on a runway that, in retrospect, was so potentially hazardous. We weren't on a vital mission. It was a logistics flight, our next stop was only 150 miles away and we had plenty of fuel. Neither the PPC nor I are risk takers or daredevils. We have always done the "cautious" thing, even when it was time-consuming, inconvenient or maybe not even necessary. Hadn't we just added more than three hours to an already long day by insisting on always doing the safe thing? We knew the RCR was 03, and we got a good look at the runway during our low pass. So why did we try it?

Not speaking for anyone else, I know that I had supreme confidence in the ability of those big fans on our wings to stop us under almost any conditions. In addition, P-3s have high capacity brakes that are rarely used except at very low speeds since reverse thrust is so efficient. But I never really considered that tire traction was so important to lateral control. When an aircraft as massive as a P-3 starts to fishtail on a virtually frictionless surface, it takes a great deal of expertise with the power levers and rudder pedals to steady it up again.

Additionally, I had no real appreciation for what an RCR of 03 means. The expected increase in landing roll (using wheel brakes) is projected as "100 percent or more," but reading about "nil" braking action and actually experiencing it are two different things. While it is true that P3's use reverse thrust more than wheel brakes for stopping power, landing roll will nevertheless increase since total reverse thrust is reduced as the requirement for directional control increases. Crosswind component is another important consideration during low RCR landings. We checked it prior to the approach, and it was well within the NATOPS recommended limit, but even a small crosswind can have a big effect on controllability under these circumstances. An RCR at the bottom of the scale may not just suggest added caution, it may also suggest that the cautious thing to do is find a better field. A bad RCR could close a field with CAVU weather just as effectively as if it were zero-zero.

In retrospect, along with all of our other briefs, we should have discussed the possibility of a waveoff once the aircraft was on the deck, anticipating the need to reset the flaps and trim. Looking back on that day, the safest and most sensible course of action would have been to continue on to our next stop. We had no real need to test our skills by attempting the landing and no real appreciation for just how hazardous the attempt would be. When faced with a similar situation in the future, I will seriously consider my alternatives to landing and the consequences of an unsuccessful attempt. ◄



Living an Approach Article or all is well and pressing on

By Lt. M. Carriker
VA-27

LOOKING down at a low overcast from six miles up, sipping my gin and tonic, I hear the airline captain come up on the intercom. "Folks" he drawls, "we are slowing down and dropping the landing gear to cool off a warm right brake." I hear the gear drop, raise and the engines spool up. The intercom comes on again, "The brake cooled right down, so all is well and we are pressing on."

It then dawned on me that I had said that same line numerous times on my flights the day before. It had also occurred to me that I had lived through an Approach article and I know better.

You know Approach articles. Somebody telling his mistakes or someone telling how not to be a dummy. I've read Approach cover to cover since AOCS. Pay attention and learn, I tell myself. It may keep you alive.

The saga started as an incredibly good deal: Ferry a jet bound for overhaul to an East Coast rework facility and bring a completed one home. Twelve hours cross-country, middle of the week and funded orders to top it off. Choose me! The maintenance officer says go on Wednesday and come back on Thursday, nine days before Christmas. Tuesday comes, I call weather, scribble out some fuel figures and a course to NARF EAST. I'd just spent a week proofing a computer program to do just this. I knew I would get there, so no detailed jet log (much less the TACAN identifiers dit-dahs of the training command). Show up on Wednesday; not so fast, the jet is still broken. Thursday it is still broken. It looks like Friday and a weekend visit to NARF EAST — the weekend before the Christmas weekend. I wasn't planning on doing my Christmas shopping 2,500 miles from home. Friday comes: No part and a reprieve from the weekend.

By Tuesday the jet is up but the weather is down, everywhere. I convince the skipper it is too bad to go and I'll try Wednesday. The weather improves slightly Wednesday, and three legs may work. I give NARF a call and uh-oh, the return jet has not even been test flown yet! The maintenance folks from the wing call over and inform me that the jet goes *today* or they lose the rework slot forever. Visions of a

NARF Christmas and a disappointed wife dance in my head. I call Ferry Squadron East. "How am I gonna get home??" "No problem," says the chief, "Get a transportation request cut and fly commercial." Oh great, four days before Christmas and try to get airline reservations across the country. I call the local travel section, and they need five days notice. I call NARF transportation, and they come through when the pressure is on.

The skipper comes by. "I want you in there before dark —safely." I call to recheck weather and find out our sister squadron is going to the same place. I ask to join up and give him my SSN and aircraft bureau number. Preflight planning completed, I hustle the duty driver to travel for the tickets, hold a hallway brief with my lead and go to man up. I plan enough to get a second hook point (the plane will need two field arrests en route), and a brief on how to change it.

Lighting off my jet I realize that my inflight gouge book is still beside the computer. I call base to deliver it — and a southeast approach plate and a HI East chart. The duty driver runs out with them all — including my airline tickets. Now I'm ready to taxi, but a boarding step door won't stay closed. "Take it off," I advise. Bolts won't come loose. Not knowing the max extend speed of step, I risk it and call up and ready. All is well and pressing on.

One hundred knots on the tail makes the leg to Southwest AFB a short hop. Just having operated out of there for a week, I was familiar with the area. Even the radios were still channelized to their frequencies. We hop out, refile (the ATC computer dumped the first flight plan) and over a coke I brief to lead the next leg. It is a straight shot to NAS Bourbon Street, just past a thunderstorm front. On start, my chart blows out of the plane, goes down the ramp — (not down the intake) — and is gone. A call to my wingman provides another map. I copy down pertinent frequencies and TACAN channels and call the taxi. "All is well and pressing on," I think to myself.

Passing 18,000 feet I can't get my altimeter to go to reset. Leveling off at 37,000 feet, center calls me 500 feet high. Not wanting to guess at an altitude to suit center I relinquish the lead. Arriving at NAS Bourbon Street we break up for individual GCA's (my altimeter error is negligible below FL 240, and field elevation is one foot so the RADALT will be helpful). Despite a high cross wind, the landing is OK. Taxiing to the transient line, I get a call of "Dash two, left at the next intersection, follow your lead." Field diagram in hand I look to find my lead who is already on the ramp and parked. Passing a left turn off to the P-3 ramp, I look down the taxiway for an intersection, no taxi light on. Somebody once told me that REAL Navy pilots don't use taxi lights — wrong answer! Suddenly two police barricades with a dim light apiece appear on the taxiway. Firm brake pressure results in two *loud* noises, but I stop short. "Hello Ground, No I won't be able to turn around and exit onto the P-3 ramp." Downlocks on, I shut down and hop out with an indescribable feeling of stupidity, anger with myself and the ground controller and the thought of missing my flight home.

A quick call to Reserve Corsair Bourbon Street results in two new tires and some recalled folks to change them. Two hours later the jet is ready to roll. My lead has pressed on to beat an incoming storm. I plan a route and check the weather. Not too good. Five hundred feet broken, 1 ¼ mile visibility in fog, occasionally 200 overcast ½ mile. A call to NARF East weather says the same. No improvement till late tomorrow — zero-zero till noon. Well it is minimums, so I find a suitable alternate and file (for FL 200 so my altimeter reads OK). Walking to my steed I think of times I've launched in that weather at the ship and if I nail the numbers I will be OK. Again, "all is well and pressing on."

Start, taxi and call for takeoff with lightning close by and the wind picking up.

The flight to NARF East was quiet and peaceful. With "George" flying, I take a good preview of approaches and set up my navaids. A well-called GCA has me seeing the approach lights at 250 feet and half the runway at 200 feet. I take the arresting gear due to water on the runway. Taxiing to the hangar, I receive a query from tower on why I'm taxiing so slow (I didn't remember that I had no anti-skid due to no exciter rings on the wheels replaced by the Reserves). At NARF East they have to tell me to turn off my taxi light. They want to know why an airplane with two new tires is coming to be reworked. I fill out the paperwork and head for the Q.

Sipping my gin and tonic, I think it must be kind of embarrassing to the captain to have to tell 200 people that something is wrong. I think I have a hard time admitting that something is wrong to myself.

Another gin and tonic and deep thoughts on the subject revealed:

— The pilot — either a single-seat or a 10-man crew — is never better than the airplane. There are just too many things you can't positively control.

— Whether or not you have done it before, there is something different every time, be it weather, landing fields or available equipment.

— As Clint Eastwood's Dirty Harry said — "A man has to know his limitations." Admitting that you can't hack it may save two valuable resources, you and your plane.

— Attention to the task at hand. Paramount importance in flight school. That was all there was — flying. Now there are officer responsibilities, many and varied systems on board the aircraft that demand attention and pressures from the world outside the cockpit.

Once you say "I'm going flying" that is your one and only concern. Know all you can — so you can say "All went well and the flight is over."

I still read Approach, always will. Pay attention and you can learn.

The Survival Equation

By Lt. D.L. Schultz
VA-27

HAVE you ever wondered, while reading a class alpha flight mishap report, what made the difference between moderate and fatal injury? Having been in such a situation, I feel that I might be able to shed some light on the subject.

Briefly, the mishap was caused by a low altitude, high speed departure in the bombing pattern. Briefed flight scenario was low level, high threat, close air support with MK-82 inert bombs, dropping one bomb per pass. Delivery parameters were 20-degree dive, 2,000-foot AGL (6,000-foot MSL) release, followed by high-G manuevering off target. The departure occurred during the first "jink," and the first indication of trouble was adverse yaw followed by rapid roll.

There were four major factors comprising the survival equation that prevented me from joining my comrades-in-arms who are presently statistics. The first of these was a positive decision on when and how to eject, based on countless hours of "hangar flying" and a healthy respect for "what if . . . ." I had a solid plan of action starting with the lower ejection handles in any time-critical egress situation. This plan continued through the ejection sequence and all the way to SAR pickup. One specific advantage available through this kind of planning was the ability to channel temporal distortion (when seconds seem like minutes) into useful functions. The time from initiation of ejection to pilot ground impact was estimated to be four seconds (initiation of ejection to aircraft ground impact was approximately 2.5 seconds). During this time, I had ample opportunity to consciously decide not to inflate my LPA, not to deploy my raft and to prepare for a parachute landing fall on ground impact.

The second factor in the equation was my experience in the aircraft, particularly in departure recognition and recovery. Because of a high deceleration rate (high altitude, high gross weight, high drag, high-G maneuver), the normal stall cues of buffet and rudder pedal shaker were not apparent. Thus, the first hint of trouble came in an uncommanded yawing moment. Thanks to ample opportunity to practice high angle-of-attack maneuvering on syllabus departure training, ACM* and FCF** profiles, I had no doubt about the out-of-control situation. I was also certain that I could not recover the aircraft in the 1-2,000 feet of altitude available. Grasping the lower ejection handle and pulling while in a rapid roll to about 160 degree angle of bank was my "recovery" maneuver. The third factor in the survival equation and one which I had little control over was the professionalism and attention to detail displayed by the squadron and AIMD AMEs and PRs. We pilots place a lot of confidence in our egress systems, but they will function only as well as they are maintained. For example, the rocket motors and cartridges in my seat were approaching high-time and were changed the night before my flight. The PR who packed my parachute at NAS Cubi Point was obviously paying close attention to his job and not day-dreaming of Philippine liberty.

The last factor I feel obliged to mention was also not subject to my control but proved a vital role in the survival equation. This factor has many names — luck, fate, the "right stuff" — but the one I prefer is the hand of God, reaching out to save this aviator for another day.

So after reviewing the facts and opinions maybe you have come up with some additional factors to enhance your own survival equation, should it ever come to pass. These four basic ones are just a beginning: have a plan (could it happen to me?), train in all authorized flight regimes (would I recognize the problem?), show the troops you care about their fine hard work (can I trust the finished product?), and whatever your definition of God, luck or the "right stuff," try to corner your share of the market in it.

*Air Combat Maneuvering
**Functional Check Flight

Ehmer's Postulate

By Lcdr. P.H. Mills
VA-27 Maintenance Officer

WHEN I was a young flight student, I was once told by my instructor that he could tell how good the pilot of another aircraft was by how he talked on the radio. As you may have guessed, I was dumbstruck to think that excellence in this business of iron will, steel nerves, lightning reflexes and death-defying aerial feats could be reduced to something as simple as how I talk on the radio!

During our debrief of that day's hop, he went on to explain that, while radio technique had very little to do with aviation ability, it was an excellent *indicator* of one's *professionalism.* The pilot who stammered and stuttered while trying to convey a simple thought over the radio obviously has not studied enough to talk and fly at the same time. The professional, on the other hand, has studied procedures and drilled himself to the extent that he conveys a clear message in a minimum of time and the fewest words possible.

I have had 12 years to reflect upon the truth and impact of this lesson and have concluded two things. *First,* that his grossly general and unsubstantiated statement seems to be true in naval aviation: "If he *sounds* like he knows what he's doing while he's airborne, then he probably does," (Ehmer's Postulate of Perceived Professionalism). *Second,* that this postulate seems to have other, much broader applications.

Having spent nearly two-thirds of my naval career in aircraft maintenance, I have often tried to discern what makes one maintenance department more successful than another. Why do two squadrons on the same ship, who depend upon the same supply system for support, have such vastly different records? So many times I have seen comparisons where one squadron consistently boasted better aircraft availability, better FMC rates, fewer repeat gripes, fewer before flight and in flight aborts, and consequently had not only a better operational record — number of sorties flown and missions completed — but also a better safety record. After observing these comparisons for the past 12 years, I am now ready to make a statement just as general and scientifically unfounded as my one-time mentor; "Good housekeeping is the sign of quality maintenance." When a crew polices its own area as it works, it produces higher quality work.

Actually this is only a "perception of professionalism" — i.e., they "look good." But what is it that makes the real difference? The squadron that takes the time — or shows enough discipline — to clean while it works is normally the one that will take the time to do a complete job of troubleshooting before completing a repair action. Others will attack the first discrepancy they find, saving the rest for the next hop. If they bother to troubleshoot completely, they probably go to such "extraordinary lengths" as to consult the MIMS prior to going in work. (It's a truly heartwarming sight to see a 10-foot sheet from the MIARS printer taped to the fuselage of an A-7E when the maintenance crew starts work on a gripe!) These same professional zealots are the ones who never seem to drop safety wire on the deck but instead put it into a FOD bag! The very ones who *always* inventory their tools before a job as well as after it, and even at shift change. The difference is ATTITUDE! They have a *professional attitude.* They accept nothing less than proper maintenance procedures every time. With enough practice it becomes an annoyingly persistent habit — annoying to the competition, that is — which can remain with that professional even through the high-tempo operations of the carrier flight deck.

Ehmer's Postulate, then, may not be just a gross generality with no substance. It simply recognizes one of those *characteristics* which *indicates solid, professional maintenance practices: Good housekeeping!*

Approach Toward Disaster

By Lt. Russ Lanker
VP-50

THE day began with a late morning preflight for an afternoon reposition from North AFB to NAS Island. A flight plan was filed requesting an en route delay of 30 minutes for practice approaches at Midroute AFB. The pilots were briefed on all significant weather, winds and predicted altimeter settings. Takeoff and climb to cruise altitude were uneventful.

Sixty nautical miles from the en route delay point, the aircraft was given an en route descent with instructions to contact midroute approach control. When contact with approach control was established, the aircraft was given the current weather and an altimeter setting at Midroute AFB of 31.03 inches Hg, which was two inches higher than briefed. Noting the variance, the flight station requested confirmation of the setting and was again given 31.03 inches. Finding this value hard to believe, the flight station responded with what seemed to them to be the only possible answer, "Roger, understand current altimeter 30.13." The controller responded somewhat indignantly, "Negative! Altimeter 31.03!!!" The flight station accepted this setting in number but not in fact.

The briefed DD175-1 altimeter setting was 28.92 inches. This fact, coupled with 18 months of high altitude flying experience without seeing a setting close to 31.03 inches, alerted both pilots to what appeared to be an erroneous setting even though the Midroute AFB controller had confirmed it twice.

The aircraft was then cleared to 2,800 feet for the approach. The PPC carefully monitored the radar altimeter during descent. Passing 7,000 feet on the barometric altimeter, the radar altimeter indicated approximately 5,000 feet. The terrain was flat, weather conditions were day/VFR and the field elevation was reverified from the approach plate to be approximately 60 feet. In view of these conditions, the plane commander elected to continue the approach and subsequent descent while carefully comparing the radar and barometric altimeters.

When the aircraft leveled off at the assigned altitude of 2,800 feet MSL, the radar altimeter indicated 750 feet AGL. At this point the pilot passed the barometric and radar altimeter indications to approach control and again requested (third time) confirmation of the current altimeter setting. Seconds later came the anticipated reply, "Roger, new altimeter 29.02!" When the new setting was set into the kollsman window, a barometric altitude of 2,000 feet lower was the obvious result. The next step on the approach was to intercept the final approach course and descend to 1,300 feet MSL.

Now, let's change the situation a little and apply the controller's original altimeter setting (31.03). Had this scenario occurred under night/IFR conditions with an inoperable radar altimeter, THE AIRCRAFT AND, NEEDLESS TO SAY, THE AIRCREW, WOULD HAVE BEEN HISTORY! Impact with the surface would have occurred with the barometric altimeter reading approximately 2,000 feet MSL. Fortunately for all parties concerned, this evolution had a safe ending and reinforced some valuable aviation axioms:

- Don't always believe everything you are told via the radios. Nothing can substitute for sound judgment.
- Don't hesitate to question something that just doesn't seem right. Blind adherence to controller's instructions without the flight station having the "BIG PICTURE" is totally unacceptable.
- The importance of having the copilot backing up the pilot at the controls and using all available indicators is absolutely essential for the safe operation of multiengine/multipiloted aircraft. ◄

Rabbit at 10 O'clock!

Another "Harey" Tale

By Bud Baer
Approach Writer

OUR mission was to be the flareship for a night air-to-ground bombing/strafing exercise.

We were outfitted with multiple ejector racks (MERs), three left outboard and three right outboard. Each MER carried six LUU-2 B/B flares to light up the targets.

We had been given the usual brief, what to do in the unlikely event a flare would inadvertently ignite during flight and turn our wing into a Roman candle. This included jettison procedures, cockpit switchology, command ejection procedures, etc. For some reason we didn't seem too attentive. Perhaps we should have been.

Cleared for takeoff, we headed down the runway. Upon reaching rotation airspeed, I saw something moving on the runway ahead. "What's that thing? It's getting bigger and bigger. Look at those long ears. Well, I'll be a bunny's uncle — it's a jackrabbit!"

"Rabbit on the runway coming up fast under our left wing," I called.

Then we felt a very slight impact or scraping on the takeoff roll. "Poor guy. He's had it. But what about us?"

We raised the gear and told the tower, "Possible impact with jackrabbit on takeoff at about 2,500 feet from threshold." Response: "You gotta be kidding. Bet you missed him by a hare's breath."

Following NATOPS to the letter regarding rabbit strikes, we asked for a visual check of the landing gear for possible damage. We remained below 225 knots in the climbout and lowered the gear at about 7,000 feet. Then we moved to 9,000 feet and circled the field at 170-190 knots with half flaps selected.

Meanwhile, the tower cleared one of our bomber/strafers for takeoff and requested it perform a close-in visual of our underside before continuing the mission. Simultaneously, the tower dispatched operations personnel to search the runway for long-eared FOD (ears attached or unattached) in the 2,500-foot area from threshold area.

Nothing was found on the runway, so maybe Bugs B. was away free or, then again, maybe he was hanging by his ears from some of MER garbage protruding beneath our wings. Now we were beginning to worry that the National Wildlife Federation would be on our tail.

About five minutes after takeoff as the other aircraft was moving in for a closeup looksee, a bright light suddenly illuminated both our front and rear cockpits. "Geez, what's happening? My copilot's cockpit is all lit up! No, it's the left wing!"

Suddenly an intense phosphorescent white light appeared under and aft of the left wing with a spewing effect similar to hundreds of Fourth of July sparklers burning away. It became so bright it obscured the detail of the wing.

I told the copilot in no uncertain terms, "Get rid of them," meaning precisely that he jettison the flares immediately (as per the flight brief we slept through). But for some reason he didn't recall this transmission and didn't initiate emergency jettison.

"We have a fire on the left wing," I reported over UHF. I could see it was spreading and I automatically pulled the emergency jettison handle. While looking at the fire I saw something fall away from the left wing. It appeared cooked to a crisp and may have had long ears.

It was obvious that the fire was continuing to burn the wing. I pulled the emergency jettison handle two more times in rapid succession.

Our flying flame began to roll left at a slow rate. I attempted to counter the roll with right stick but felt no response.

It was obvious the fire was continuing to spread and intensifying as it was being fuel fed at a rapidly increasing pace.

My copilot also had his eyes glued to the spreading inferno approaching and positioned himself for ejection. He pulled the emergency stores jettison handle three times. He assumed from the outset that I had already attempted to jettison the external stores.

Our flying torch continued to roll left. As the left bank approached 80-90 degrees, I felt the nose falling below the horizon. I tried to correct the roll and pitch but the controls were frozen. We were rolling toward an inverted position with the nose continuing to drop.

"We're going to have to get out. Okay, we're leaving. Eject, eject, eject!"

I checked my body position and started the downward movement of the face curtain. I felt the ejection sequence begin before I could complete full travel of the face curtain. My copilot initiated ejection as per the flight brief.

Both of our ejection sequences were normal. We ejected at about 4,000 feet with the plane practically upside down and the nose at 45 to 90 degrees below the horizon.

After my chute opened, I saw our aircraft fall to impact with the intense bright burning flares giving it a spectacular exit.

My descent was a peaceful respite over what I had just experienced and what was ahead. I thought about how I'd explain what happened to the powers that be. Why? Would anyone ever believe that a rabbit could knock a jet out of the sky? Do you?

Fire at High Power

By Lt. Jim McClean
VA-196

IT was an average day at USAFB "Somewhere in the desert." A Navy medium attack squadron was on a detachment at this AFB participating in a major interservice air exercise. One of the A-6E Intruders had been downed for "port engine chugs." Following the appropriate maintenance action on the aircraft, it was taken to the high power turn-up area for high power checks by a qualified and experienced power plants petty officer and his crew.

As a sidelight, remember that the Air Force does not use JP5 as its primary jet fuel but rather JP4. JP4 has a lower flashpoint and therefore a higher volatility. Consequently, Air Force regulations require a fire truck to be present for all low/high power engine turns. Their fire trucks are equipped with HALON 7211, a new firefighting agent which is highly effective against Class A, B and C fires. At first glance one might shrug off this regulation as an unnecessary precaution, but is it really?

Aircraft 500 was started, and the port engine run up to high power five times to check for engine chugs. The first four runups were uneventful. On the fifth runup the port engine developed a major fuel leak, spewing JP4 onto the ground and the hot engine casing. The fuel ignited instantly, and the aircraft was engulfed in flames. The power plants specialist in the cockpit immediately secured the throttles, engine fuel masters and bleed air valves. He then rapidly egressed the aircraft. At the same time, the fire truck sprayed the aircraft with halon which immediately put out the fire.

Quick and appropriate action on the part of the power plants specialist and the fire team saved this aircraft with only minor damage. It was flying again shortly.

The dangers associated with JP4 pose some interesting questions for aircrews. What if this incident had occurred in flight? Could this happen to you on a cross-country when you stop at an AFB for gas? What if you inflight refuel from an Air Force tanker? Do you let maintenance control know there is JP4 in the aircraft? Think about it!

Fuel for Thought

By Lt. Russ Carlton
VF-51

... 10 minutes of fuel, with 30 minutes to the nearest field. A young pilot and RIO came within seconds of a long, cold swim.

LIKE every good mission (and every good story), this one had a beginning, a middle and an end. In this case, however, the middle was a little more interesting than most, and the end almost came a whole lot sooner than it was supposed to. Let the story begin . . .

The fighter squadron had deployed to MCAS Yuma to complete the Fleet Fighter Aircrew Readiness Program (FFARP). In addition to this, it was tasked with flying 12 sortic during the weekend break in support of Readiex 84. Two aircrews arrived at the squadron Saturday morning to brief the missions they were scheduled to fly that afternoon. They were asked to fly a simulated ASCM profile which

required a supersonic dash for a distance in excess of 80 nm. It was stressed that flying the profile was the primary goal, followed in priority by (a) making it overhead the target and (b) maintaining supersonic speed. The target was estimated to be 300 nm southwest of NAS Miramar.

After careful study of the F-14A performance charts, the crews decided that they would have sufficient fuel to fly the profile as requested if they flew to and from the exercise arena using a maximum range profile. They also decided that if fuel usage was greater than planned, the supersonic dash would be subsonic instead and that, in any event, once bingo was reached, the run must be broken off and the nose pointed home. It was also noted that there would be two opposing force tankers airborne, should any problems arise.

The brief concluded, the crews suited up, manned up and started up on time. Takeoff was delayed about 10 minutes due to unusually heavy traffic in the pattern. The crew discussed this, decided to continue as briefed and called ahead to let the strike controllers know they would be late. The aircraft were finally cleared for individual takeoffs and proceeded to their respective initial points independently. Both crews closely monitored fuel usage and concluded that the supersonic run was in order.

The first F-14 began its dash as planned, staging into zone 2 afterburner to maintain 1.1 indicated mach at 85 nm to go. Fuel quantity at this point was 10,500 pounds, slightly better than planned. A dive was commenced at 55 nm; the pilot deselected afterburner, and the aircraft slowly decelerated to .9 imn. At this point, clearance was given for a supersonic pass overhead the target at 2,500 feet, and the RIO called the pilot's attention to the fact that the fuel totalizer had begun to oscillate plus or minus 2,500 pounds.

The pilot acknowledged this but did not give it much attention since the F-14's totalizer is known to be unrealiable while in a nose-down attitude. Since fuel usage had been less than expected earlier, there was no reason to believe that a real problem had developed. Meanwhile, there were other aircraft to look out for and an obscure target to find. The F-14 leveled off at 2,500 feet, and finally, at 10 nm, the target was spotted. At 6 nm, afterburner was selected, and the F-14 passed overhead at 1.0 imn. Once clear of the target area, afterburner was deselected, and a rapid climb commenced toward home.

Upon leveling off, the fuel totalizer settled down and fixed upon 2,600 pounds, about 3,500 pounds below where it should have been and 2,900 pounds below the 300 nm bingo! The crew forecast they would need 900 pounds more fuel than they had to make it. Some quick troubleshooting failed to reveal any fuel indication error, so an emergency was declared and the opposing force E-2 was encouraged to disclose the location of the tanker. After some initial difficulty in finding it on his scope, the controller finally vectored a KA-6D to the distressed Tomcat from its position about 150 nm away, where it had just gotten a good refueling package check. The Tomcat told the tanker to meet him at 20,000 feet and upon getting radar contact, began a descent from 37,000 feet. The rendezvous was accomplished as the tanker turned toward Miramar, and the thirsty fighter plugged in.

End of story? Not so fast. The supposedly "sweet" tanker immediately had a hose reel take up-failure. The F-14 backed out and cleared to the right while the tanker recycled the hose. Another try failed again. Luckily, or so they thought, the KA-6D also carried a D-704 buddy store.

By this time the fighter's state was 1,200 pounds or less than 10 minutes of fuel with 30 minutes to the nearest field. They plugged into the second package after a little fencing with a damaged drogue, only to discover that it would not transfer, even with override selected! State was 900 pounds and burning fuel faster at tanking speed. The fighter backed out and told the tanker to stream the first package again; they would continue to try it until either it worked or fuel was exhausted. The other tanker was on the way but could not arrive before projected flameout.

On the first try, the hose take-up functioned properly and transfer was successful. Minimum fuel indicated was just under 600 pounds. Actual state could have been even less since the F-14 fuel gauge is only accurate to plus or minus 300 pounds. The fighter took on 3,500 pounds, then executed a bingo profile to Miramar.

What actually caused this near tragedy may never be known. Among the possibilities are uncommanded fuel dump, a faulty fuel gauge and pilot error in reading/interpreting the fuel gauge. It is known that the F-14 fuel totalizer exhibits a tendency to lag during high fuel flow rates and/or nose-down attitudes. While in afterburner, the engine feed fuel tanks can be depleted without that being reflected on the totalizer. The only way the pilot has of knowing whether this is happening is by monitoring the tank group tapes and feed windows and watching for a discrepancy between them and the totalizer. This requires a great deal of attention from the pilot (the RIO has only a totalizer). Because of the extraordinary high rate at which the F-14 burns fuel in afterburner, a momentary lapse in the pilot's attention can be most unfortunate. In this case, a lot of good luck saved one Tomcat from a watery grave, and somewhere out there, a young pilot and RIO who came within seconds of a long, cold swim are a whole lot more careful about fuel. ◄

Tool Control for Aircrew

By Lcdr. C. Drake
VF-21

The rush to get the airplane ready for launch continues. A piece of avionics equipment goes down. The ever-ready AT troubleshooter opens a panel, does his magic incantations and the gear is back up. After he buttons up the panel, you notice him double-checking his quick inventory tool pouch. It gives you a good feeling to realize that the maintenance technicians in your squadrón are professionals and take tool control very seriously.

HOWEVER, the technicians are not the only group that works in and around aircraft. We, the aircrew, do also. We, too, should make every effort to fully support tool control as well as the rest of the FOD prevention programs.

The way our squadron has approached aircrew tool control is quite simple: each aircrew member is specifically tasked, by instruction, with the pre- and postflight inspection of his flight gear to ensure that each piece of equipment is intact and that all incidentals (such as pens, pencils and flight publications) are accounted for. Should any items be missing, an immediate report is made to maintenance control where the missing item is treated as a lost tool and a MAF is initiated. To aid in the ability to perform such an inspection, we have standardized several of our routinely used items.

Pocket checklists and other aircrew aids that are held together by metallic rings are required to have every hole filled (up to a maximum of four) and heat shrink material applied around the ring break points. In addition to allowing a quick visual confirmation that all rings are there, this prevents the rings from coming apart unless cut for insertion of new material.

Standard issue flashlights* have been modified to have fewer loose items. The original bottom section is removed and properly disposed of prior to issue. The red filter is permanently glued into the lens holder. The lens holder is then screwed to the bottom of the flashlight until a red lens is required; it then is simply screwed over the bulb section. The two seldomly used threaded joints are wrapped with ½-inch-wide ordnance tape and each separate piece is etched with the aircrew man's name and VF-21 for ready identification. Those who opt for an additional small flashlight with a long, flexible gooseneck have had the same modifications incorporated.

*For those who don't have the new compact flashlights — Ed.

We use helmet and flight publication bags with a variety of designs and features. All have been found to be satisfactory as long as the designs incorporate means for a positive closure of all openings by zippers, Velcro or drawstrings. We also remind ourselves to ensure that only appropriate materials are carried in them.

Standard issue kneeboards, with their attached springs, clips and light lenses, have proven to be particularly FOD-prone items. We deFOD, stencil and closely inspect them prior to use. If an alternate style kneeboard is desired, it is etched, then inspected by the FOD officer for FOD-causing design deficiencies prior to use in our aircraft.

Any desired optional equipment, be it survival or miscellaneous (such as spare light bulbs), is installed in the survival vest by a qualified parachute rigger in accordance with existing directives.

We feel that the active compliance with the aircrew member tool control program serves to prevent FOD in the cockpit, but perhaps even more importantly, it heightens our FOD awareness and serves as a positive leadership example.

Just Another Fly Off

By Cdr. "Paco" Campbell
VA-146

A BEAUTIFUL, clear hot morning in the Philippine Sea. Great day for a fly off to Cubi. We've been at sea for a month and, boy, am I tired! Get a quick test hop done on this hangar queen and before you know it I'll be sipping on a cold San Miguel. Can't believe we finally got this old Corsair up. Hasn't flown in two months but the master chief works miracles. When he says the plane is up and ready to fly, it always gets airborne.

Preflight, start, poststart went like clockwork. I'm the first aircraft on CAT 2 — great. Take tension, run it up, everything is go. Think I'll pop that ol' cat officer the bird. He likes that stuff.

Bam, good stroke. What the . . . ? Right side has squatted down. Flat tire? No, worse! Something is wrong with the right strut. Still accelerating down the cat. Launch bar is holding. Feels sort of sideways. End of the stroke — got flying speed. Rolling right — got to stop the roll. Full left stick, left rudder — still rolling right. No chance — got to get out. Hold the stick — use the lower handle with the left hand. Damn, nothing happened! Two hands — pull. BAM — out — whap — chute — splash!

In the water, I can see the surface up there. Can't breathe — no emergency oxygen! Got to get the LPA inflated. Got it. Have to get to the surface. Coming up. Can't breathe. Made it. Can't keep my head up out of the water! What is pushing my head down? Damn lobes aren't inflated. Pull open these Velcro collar pieces. OK, floating upright now. Chute is still on. Damn parachute lines are everywhere. Got the Koch fittings off. Let me back out of here before this chute goes down. These lines stick like glue to the Velcro pads on my survival vest and G-suit.

Ok, clear of the chute. Where am I? Where is the helo? Aha, there's the ship. Looks like a few thousand yards. Don't see the helo. Better open this seat kit and get my raft out. Here it is. Let's see; pull this toggle. Ok, got a raft, now to hook my SERE kit to it. I need to get rid of my seat pan prior to pulling myself in. Ok, in the raft. Damn, am I pooped!

Where the hell is the helo? OK, there is one lifting from the angle deck, better get ready to light off a smoke. Got one here in my vest. Looks like he sees me. Heading right my way. What was it that took him so long? OK, pop the smoke. Good smoke. Get out of the raft. Think I'll hang on to the side of it until I'm sure he's going to get me. Swimmer is coming down on the hoist.

Push away from the raft. Damn down wash, can't see anything. "Yeah, I'm all right. No, nothing is broken." Clip the "D" ring on the hoist. Both of us are going up together. I feel like I weigh a million pounds. Spinnin' around. I'm scared to death of jammin' my fingers in that winch. Up to the top-swing-swing-ouch, rapped my shins.

Whew, I'm inside. Wow, what an experience that was! "Hey, what took you guys so long?" "Had too many passengers, too heavy to hover. Had to go back aboard, off load and then come and get you." "Oh — hey, no sweat; piece of cake; I had everything under control anyway." ◄

"Bruise 466" comes ashore.

Lcdr. Dave Howard (left),
Ens. "Doc" Benjamin (right).

Lcdr. Dave Howard
Ens. "Doc" Benjamin

WHAT was to be a routine training flight for instructor pilot Lcdr. Dave Howard and his crew on 12 August 1983 became the first recorded amphibious assault of the Jax Beach by an SH-3 helicopter.

After a thorough brief by replacement pilot Ens. "Doc" Benjamin, the crew reviewed the Air Discrepancy Book for "Bruise 446" and checked the NATOPS charts to determine flight performance data for the day's environmental conditions. Although it was a sunny VFR day, Jacksonville's typically hot, humid, windless conditions provided marginal single-engine capabilities for the dual-engine SH-3. The crew hot-seated into "Bruise 466" for its over-water training flight which included coupled approaches to a 40-foot, over-water hover and search and rescue pattern training. Takeoff and transit to the warning area 20 miles off the coast of Jacksonville were uneventful.

During the third coupled hover, Benjamin, who was at the controls and wearing an instrument hood, prepared to transition the aircraft to forward flight when a loud explosion was heard and number one engine began to rapidly lose power. As the helicopter settled toward the water, Howard quickly responded to the emergency by applying full power and assuming control of the aircraft to execute a smooth water landing. Both pilots noted that the number one engine had stabilized with extremely low power indications and dangerously high turbine exhaust temperature. Number one engine was subsequently secured.

Stable on the surface of the water with only a single operating engine and 16 miles from the nearest shoreline, Howard directed his copilot to complete the water landing and after water entry checklists while he radioed for assistance and contemplated the feasibility of a single-engine water takeoff. The aircrewmen in the after station, AWCM Harvey and AWAN McNeill, assisted by preparing the life raft, performing security checks of the aircraft fuselage and stowing the aircraft's removable windows.

Several aircraft operating in the vicinity responded to the crew's mayday voice report, and a communications link was established between the downed aircraft and the squadron's duty office. The magnetic anomaly detector was jettisoned and excess fuel was dumped to make the aircraft lighter for takeoff. An attempt to restart number one

engine was aborted due to a hot start. Saltwater ingestion by the number two engine had significantly reduced its power output and rendered a water takeoff virtually impossible. To save the aircraft and his crew, Howard decided to attempt a slow water taxi through calm seas to the shoreline 16 miles away. During the long transit, Benjamin monitored the remaining engine while the aircrewmen maintained security of the after station. After two and one-half hours, "Bruise 466" reached the shoreline and taxied through the surf onto Jax Beach. A CH-54 "Skycrane" subsequently airlifted the SH-3 to NAF Mayport for repair.

Lt. Tim Freeman
Lt. Phil Melfa
VF-41

A NIGHT CAP hop flown from USS *Nimitz* in the Mediterranean Sea was proceeding as scheduled for Lt. Tim Freeman, pilot, and Lt. Phil Melfa, RIO, until they had descended to 1,200 feet and were preparing their Tomcat for landing. As the flaps were lowered, the crew experienced a sudden, abrupt and rapid right roll accompanied by some left yaw. Freeman, suspecting a flap/slat asymmetry problem, immediately raised the flap handle while applying opposite rudder and lateral stick inputs in an attempt to regain control of the aircraft. Melfa closely monitored altitude, airspeed and attitude as control was regained and a climb to 5,000 feet was commenced. Normally, an F-14 experiencing control difficulties with the flaps extended, e.g., a flap/slat asymmetry without lockout protection, would make a no-flap approach. But, in addition to the dark, no-horizon night, there also was no natural wind, and the ship was unable to generate all of the necessary wind over the deck to arrest the no-flap Tomcat with any margin of safety.

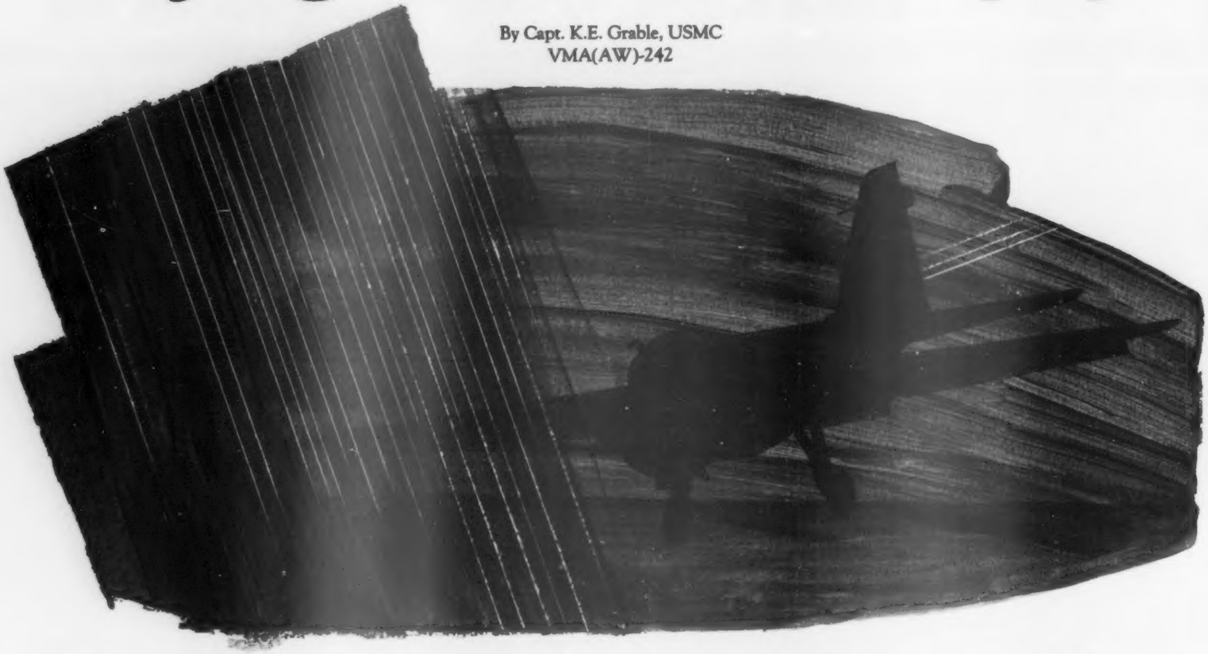
Freeman was now faced with having to reduce his approach speed to one that would be compatible with the amount of wind over the deck available. First he tried lowering the maneuvering devices, but that configuration yielded an approach speed which was too fast. Gross weight was reduced by dumping fuel and the flaps/slats were lowered in small increments to a point where an acceptable approach speed and aircraft control could both be maintained. This resulted in an approach speed of 140 KIAS and required moderate stick and rudder inputs to counter the Tomcat's pronounced tendency to roll right. Freeman's first pass resulted in a bolter. Following a trip to the tanker, he set up for another approach in the same configuration and flew an OK pass to arrestment. On landing it was confirmed that the starboard inboard main flap actuator was broken, resulting in flap asymmetry without lockout protection.

Another F-14 is still around to perform air superiority tactics because of this aircrew's immediate and correct reaction to a potentially disastrous situation. Flap/slat asymmetry without a lockout used to be a "killer," but due to education and strict compliance with NATOPS procedures, this Tomcat crew showed that it was "just another emergency."

Lt. Tim Freeman (left),
Lt. Phil Melfa (right).

Flying With Max Murphy

By Capt. K.E. Grable, USMC
VMA(AW)-242



MY B/N and I had a flight with Max Murphy last summer while in the Western Pacific. Max Murphy is known for his aphorism, "If anything can go wrong, it will." It was a Sunday and we were going to launch out of NAS Cubi Point for a local hop. then fly back to MCAS Iwakuni for our cross-country leg back home. On the preflight, I noted that the equipment nitrogen pressure had bled down to 0 psi (*well below the 600 psi minimum*). The equipment pressure is necessary to run the search radar, which can be used to determine the severity of thunderstorm cells while airborne. Since we were going on a VFR local hop, there was no need for the search radar. So Max Murphy, the B/N and I decided not to service the equipment pressure until we returned to Cubi Point.

After we took off from Cubi Point, the selectable needle on the fuel gauge went to 0. Since the selectable needle was unreliable, we could tell how much fuel there was in the fuselage cell, but not in the wing fuel cell or drop tanks. It didn't seem likely that the transient line at Cubi Point could make a quick fix on the fuel gauge, and the leg from Cubi Point to Iwakuni was some 1,000 plus miles. So Max Murphy, the B/N and I decided it would be much safer to change our flight plan and fly to Kadena AFB on Okinawa, in order to split the 1,000-mile leg into two 500-mile legs. This would avoid a long flight with an unreliable fuel gauge.

We got our clearance to Kadena and called Cubi Metro for our arrival-time-weather at Kadena. The forecast was 150 feet scattered 400 feet overcast, isolated thunderstorms in the area with temporary conditions of 200 feet overcast and thunderstorms. Max Murphy, the B/N and I said "no sweat" as we turned to the north and started climbing to 29,000 feet (FL290). By the time we reached the northern end of Luzon, we were IFR. About 100 miles from Kadena, we called Metro for an update on the weather. The forecast was the same. The main needle on the fuel gauge, which reads the fuselage fuel cell and was reliable, read 7,000 pounds. With all that extra fuel, the three of us decided to shoot some practice approaches at MCAS Futenma. We informed Naha Approach of our intentions, and they cleared us for the Hi TACAN Approach into Futenma. We called commencing the approach out of 15,000 feet and, as we were passing 8,000 feet, the controller gave us an update on the weather. By this time we were in moderate turbulence and heavy rain showers. The controller stated the new weather was 300 feet overcast and two miles visibility and asked if we would like to continue for a GCA. We answered affirmatively and continued our descent to 1,500 feet. As we passed through 4,000 feet, the controller gave us another update on the weather. The weather had deteriorated to 100 feet overcast and ½-mile visibility. It immediately hit us that the whole island was socked in, and we only had about four approaches left to get it on the deck somewhere on Okinawa, because there were no other alternates.

The B/N and I turned to each other and there he was, sitting on the center console, grinning. Max Murphy wryly said, "Thanks for the hop, I can always use the flight time." The controller asked if we would like to continue the GCA. We told him we would like to shoot the PAR at Kadena AFB. The controller replied that the GCA radar at Kadena

was down and asked us for our intentions. We stated that we wanted the Hi TACAN approach (*What else could we do?*) into Kadena. The controller cleared us to 16,000 feet direct to the IAF.

On the climbout, the left main gear indicator barberpoled, and I hadn't even touched the landing gear handle! In the back of my mind I kept thinking about what the XO always said, "The minute you have to get the plane on the deck, an A-4 will take a trap because there's a puddle on the runway." A lot of other things were running through my mind. "How is this going to look to Air Breaks? Will my raft automatically inflate? I wonder how good the SAR effort can be in this kind of weather. It is going to be dark in about an hour, at about the time we are going to flame out. Why didn't we service that equipment pressure back at Cubi Point, so we could have a search radar to guide us around these thunderstorms and possibly do a self-contained landing mode approach? How in the hell did Max Murphy get in this cockpit?"

Proceeding to the IAF, Kadena approach gave us the weather at Kadena. It was 300 feet overcast and ¼-mile visibility with heavy rain showers, which is below TACAN minimums. The B/N pulled out the pocket checklist in anticipation of hung gear when we dirtied up. We began our descent in moderate to severe turbulence. At this point, we had been IMC for about two hours. After intercepting the final approach course, the landing gear indicator showed three down and locked. That was *one* big worry behind us. We reached the "missed approach" point and still there was no field in sight. I maintained altitude and kept holding the inbound radial. Max Murphy was now sitting on my shoulders. I saw the DME go to less than 1 and the needle spinning so I just maintained heading. Max was getting heavier. I caught a glimpse of the runway lights and swooped down to land in between the lights. I knew Kadena's runway was very long with a set of bidirectional gear 1,000 feet from each end of the runway. When I touched down, I didn't know how much runway was remaining because the heavy rain showers prevented us from seeing any of the thousand-foot remaining markers. Max was so heavy by now that I could barely get my hand up to the arresting hook handle. The B/N and I saw the 6,000-foot remaining marker go by, and we let out a big sigh of relief. All of a sudden, there was a big weight off my shoulders and Max Murphy was gone.

We taxied back to the line, shut down and walked about ½ mile in the pouring rain to base ops feeling great just to be alive. As we walked inside soaking wet, a couple of pilots came up to us and asked how the weather was out there because they wanted to take off. We lied a little and told them we pressed the TACAN approach just a bit. They sort of nodded knowingly and decided to spend the night. Maybe they had flown a hop or two with Max Murphy in the past and had decided, as we had, never to do it again. ◄

FOD Word Scramble

Using the words in the two right hand columns, circle the appropriate letters to spell each term. Words may be spelled forward, backward, diagonally or up and down. When you are finished, use the remaining letters to find the hidden *Message*.

A	N	S	N	A	C	A	D	O	S
B	T	Y	N	U	T	S	F	A	G
U	R	B	N	I	Y	O	F	D	A
T	A	O	I	C	P	E	A	S	T
T	S	L	O	O	T	G	K	G	E
O	H	T	C	Y	N	K	I	A	M
N	I	S	W	E	R	C	S	R	A
S	L	I	C	N	E	P	N	I	N
S	R	E	H	S	A	W	E	N	L
E	S	E	Y	E	D	A	P	G	L

BOLTS	RAGS
BUTTONS	RIG PINS
COIN	RING
KEY	SAFETY WIRE
NAME TAGS	SCREWS
NUTS	SODA CANS
PADEYES	TOOLS
PENCILS	TRASH
PENS	WASHERS

Courtesy: AT1 Steven J. Ludwig and AMS1 Thomas J. Eaton

Snores From the Second Row

By Karl Spence

THE time is 1330; the place, an overheated readyroom. Smoke rises lazily from an ashtray and slowly filters into an asthmatic air-conditioner. At the podium stands the safety officer, notes in hand. As he drones on, heads nod. One officer however, is busily writing on a scratch pad. Is he taking notes? Nope. He is designing a new and improved Starship Enterprise. Another is mentally rebuilding a 1974 Vega engine. Yet another stares at the clock and discovers that you can actually see the minute hand move, but it takes total concentration and a very keen eye.

As you may have ascertained, we are attending a safety training session — one of the thousands held all over the world on a regular basis. Unfortunately, the sad session documented above is often the end product of the safety officer's efforts. What's wrong with this scenario? Several things:

- The room was hot and humid.
- The safety officer had no training in how to train.
- The topic was boring.
- The audience wasn't involved — the safety officer asked no questions and received no feedback.
- It was right after lunch.
- No audio-visual aids were used.
- No handouts had been prepared.
- The lecturer did not "read" his audience and either didn't know or didn't care that he was not getting through to them.

The major purpose of safety training is to minimize mishaps through awareness of potential hazards. In plain English, we have to show our people what can kill them, maim them or make them so sick that death would be a welcome relief. In this business we read mishap reports for more than idle curiosity. Surely the thousands of reports we have read can provide a meaningful data base for employee awareness sessions.

There are other purposes for training:

- Putting out the word on new programs and policies.
- Explaining ambiguous directives.
- Describing the care and use of personal protective equipment.
- Indoctrinating new personnel.
- Acquainting personnel with their safety program responsibilities.

Whether or not you are running your own session or being a guest speaker, a **Training the Trainer** session will do you good. Some local colleges and other organizations offer both long and short courses on training techniques. So does the National Safety Council ("Safety Training Methods No. 101" — one week). Sign yourself up.

- If you have the opportunity, choose an adequate training site. Look at lighting, ventilation, seating capacity, electrical service and loudspeakers. Electrical services are important. How valid do you think a session on electrical safety would be with extension cords strewn across the floor? Put away the ashtrays. DOD Instruction 6015.18 of 18 Aug 1977 prohibits smoking in conference rooms and classrooms. Your session should not run any longer than 40 minutes.
- Don't train right after lunch. Everybody is sleepy. A hot room makes it worse.
- Address a topic which involves your audience and solicit their involvement by asking them questions and asking for comments. After all, communications is a two-way street. A monologue rarely qualifies as an effective form of communications.
- Use audio-visual aids, viewgraphs, tapes and handouts. Let your audience take something with them when they leave to reinforce your topic.
- Follow a plan and don't digress for any extended period of time. All of us have been in training sessions where an unofficial spokesperson attempts to turn the session into an attack on the system or tries to question the validity of your statements by bringing up an unrelated topic such as: "Obviously, since you didn't know about the shortage of widgets in the PR shop, your views on the use of survival equipment must be examples of your ignorance also and besides that, the CO was seen flying without his oxygen mask on August 15th." There is no logic to it, but this "technique" is used frequently. Watch out for it, or else just put the guy on the podium. If you play his game, you've lost. If a situation such as this develops, tell the "spokesperson" that you will be happy to continue the discussion after the training session. Think he will stick around? Not a chance.
- Be interested, enthusiastic and sincere. Enthusiasm is mesmerizing (look at political speeches) and your audience will be interested if you are interested. Read your audience. If you are losing them, modify your approach. Move into audio-visuals or hand something out. I once showed a movie backwards — sounds crazy, but all my people remembered the movie and the safety rules illustrated.
- Summarize your topic at the conclusion of the session. This is an old trick that increases reinforcement.

Training can be personally rewarding for both the trainer and the trainee if done effectively. There are books on the subject so my article is not all-inclusive, but the ideas hopefully will provide food for thought and may eliminate the snores from the second row.

Adapted from Navy Lifeline

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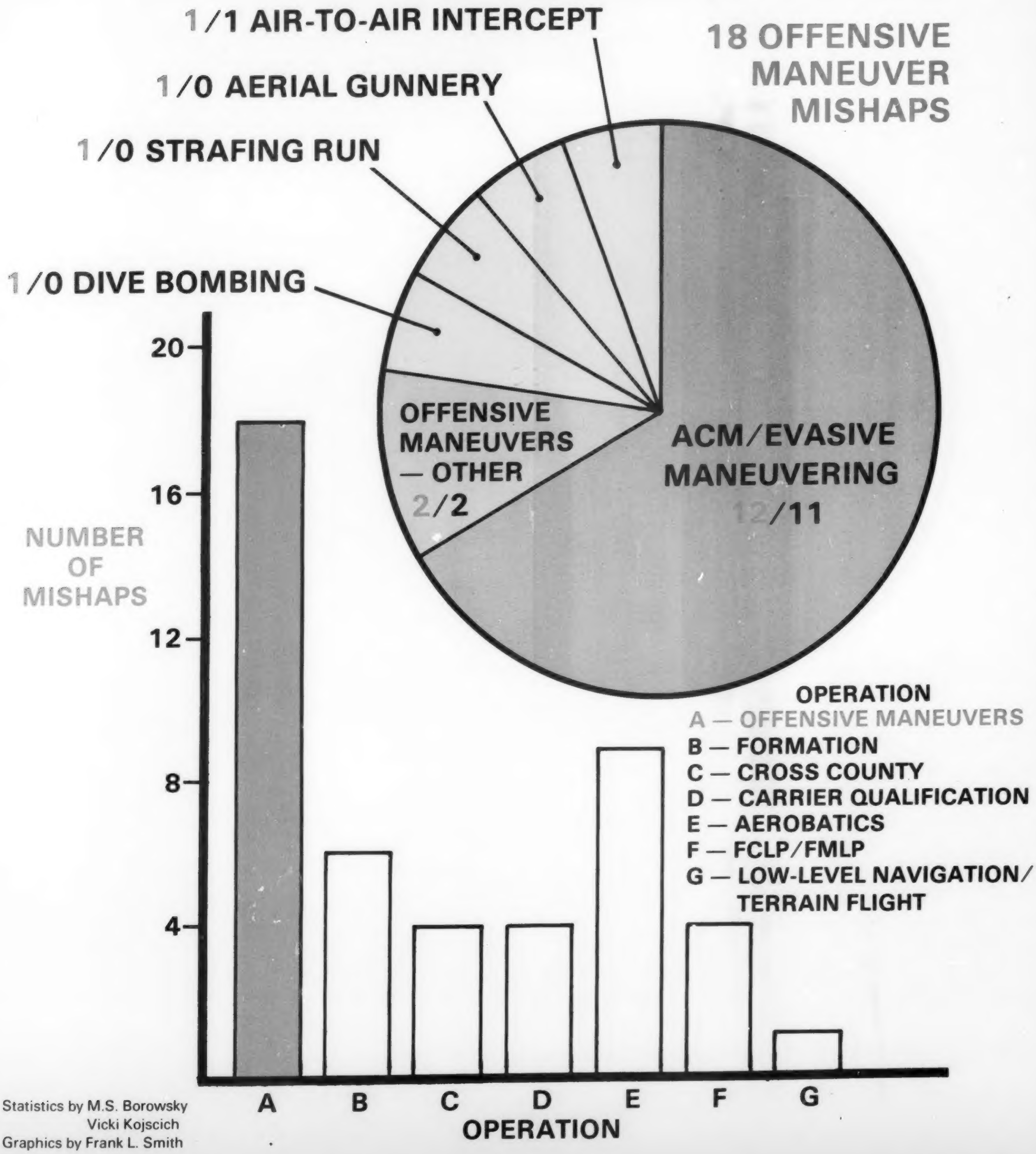
TRAINER

ALL NAVY AND MARINE
HIGH RISK FLIGHT REGIMES
CLASS A MISHAPS/PILOT CAUSAL FACTOR
CALENDAR YEARS 1977 — 82



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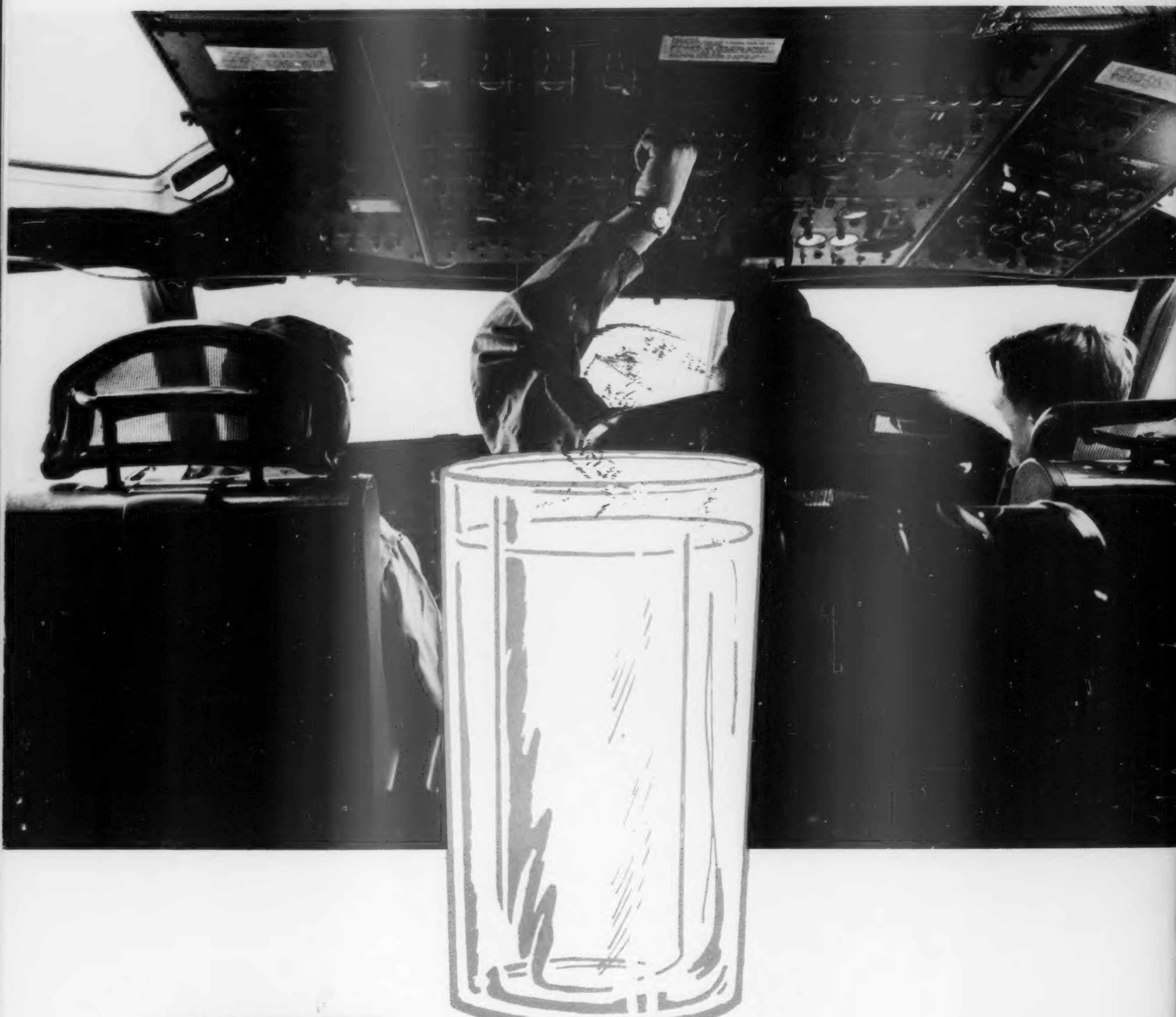

WATER The dehydrating effects of altitude, low humidity, alcohol and coffee are all trying to turn you into a beef jerky. The results: headache, fatigue, among others. Shoot for eight full glasses of water a day. It WON'T rust your pipes. And by the way — if you wait till you're thirsty, you're already about a quart low, so develop the habit.